

1350 Blair Drive, Suite A, Odenton, MD 21113 • (800) 220-3606 • FAX (410) 721-3733

September 11, 2014

Ms. Elizabeth Biller Water Permit Writer Virginia Department of Environmental Quality 13901 Crown Court Woodbridge, Virginia 22193

RE: Virginia Pollutant Discharge Elimination System

Permit Renewal #VA0001872 Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22031

Dear Ms. Biller:

Attached is information requested in your letter dated July 10, 2014:

- Form 2F Section VII.A (revised); and
- 2014 Chain of Custody and Laboratory Certificates of Analysis for Section VII.A.

Additionally, Motiva has requested that their hydrostatic test water be excluded from Outfall 106 contribution. When hydrostatic testing is conducted at their facility, the discharged waters are managed in accordance with 9VAC25-120 (General VPDES Permit for Hydrostatic Tests) through a separate discharge outfall not affiliated with the JBC. Revised Table 1, Table A-5, and Figure 7-3 are attached to reflect this update.

GES appreciates the continued guidance of the DEQ on this project. If you have any questions or would like additional information please contact the undersigned at 800-220-3606, extension 3254 or 3717, respectively, or Mike Younce of Buckeye at (703) 503-3687.

Sincerely,

Groundwater & Environmental Services, Inc.

Jenna Laube

Remediation Specialist

Gregory Reichart Project Manager

c:

Mike Younce, Buckeye Terminals, LLC (Buckeye) Peter Adamczyk, Citgo Petroleum Corporation (Citgo) Susan Horning, Motiva Enterprises, LLC (Motiva) George Conover, TransMontaigne, Inc. (TransMontaigne)

File, GES PSID #498017

### VII. Discharge information (Continued from page 3 of Form 2F)

Part A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

			. , ,			
	3	um Values ude units)		erage Values eclude units)	Number	
Pollutant and CAS Number (if available)	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Flow-Weighted Minutes Composite		of Storm Events Sampled	Sources of Pollutants
Oil and Grease	<1.4 mg/L	N/A	NA	NA	NA	NA
Biological Oxygen Demand (BOD5)	4.0 mg/L	NA	NA	NA	NA	NA
Chemical Oxygen Demand (COD)	23.3 mg/L J	NA	NA	NA	NA	NA
Total Suspended Solids (TSS)	24.4 mg/L	NA	NA	NA	1	NA
Total Nitrogen	0.58 mg/L J	NA	NA	NA	NA	NA
Total Phosphorus	<0.08 mg/L	NA	NA	NA	NA	NA
pН	Minimum 7.13	Maximum 7.13	Minimum <sub>NA</sub>	Maximum NA	1	NA.

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

	(inclu	um Values ide units)	Ave (inc	rage Values clude units)	Number	***************************************
Pollutant and CAS Number (if available)	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	of Storm Events Sampled	Sources of Pollutants
See Tables 5	and 6.					
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# Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

#### ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601

GES, Inc. Suite A 1350 Blair Dr Odenton MD 21113

August 08, 2014

Project: Fairfax Terminal Complex

Submittal Date: 07/30/2014 Group Number: 1492586 PO Number: FAIRFAX TERMINAL State of Sample Origin: VA

Client Sample Description Outfall 001 Grab Groundwater Lancaster Labs (LL) #

7549163

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC

GES, Inc.-MD

Attn: Jenna Laube

COPY TO

**ELECTRONIC** 

GES, Inc.-MD

Attn: Report Distribution

COPY TO

**ELECTRONIC** 

**GES** 

Attn: Greg Reichart

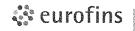
COPY TO

Respectfully Submitted,

Lyn M. Frederiksen Lynn M. Frederiksen

Principal Specialist Group Leader

(717) 556-7255



# Lancaster Laboratories Environmental

# **Analysis Report**

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Sample Description: Outfall 001 Grab Groundwater

Fairfax Terminal Complex

LL Sample # WW 7549163 LL Group # 1492586

Account # 08390

Project Name: Fairfax Terminal Complex

Collected: 07/29/2014 13:30

GES, Inc. Suite A

Submitted: 07/30/2014 16:15

1350 Blair Dr

Reported: 08/08/2014 11:43

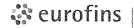
Odenton MD 21113

CAT No.	Analysis Name		CAS Number	As Rec Resul	ceived t	As Received Method Detection Limit	Dilution Factor
Wet C	hemistry E	PA 351.2		mg/l		mg/l	
00217	Kjeldahl Nitrogen		n.a.	0.58	J	0.50	1
	E	PA 353.2		mg/l		mg/l	
07882	Total Nitrite/Nitrate	Nitrogen	7727-37-9	N.D.		0.040	1
	E	PA 365.1		mg/l		mg/l	
00227	Total Phosphorus as P	(water)	7723-14-0	N.D.		0.080	1
	S	M 4500 N-	1999	mg/l		mg/l	
06165	Total NO2/NO3/TKN		n.a.	0.58	J	0.50	1
	E	PA 1664A		mg/l		mg/l	
08079	HEM (oil & grease)		n.a.	N.D.		1.4	1
	E	PA 410.4		mg/l		mg/l	
04001	Chemical Oxygen Deman	d	n.a.	23.3	J	12.8	1
	S	M 2540 D-	1997	mg/l		mg/l	
10457	Total Suspended Solid	s	n.a.	9.00		1.00	1
	S	M 5210 B-	2001	mg/l		mg/l	
00235	Biochemical Oxygen De The laboratory contro of 84%. The method a holding time had laps with client consent.	l sample ana cceptance wi	lyzed on this ndow is 85% to	o 115%.	Because the	48-hour	1

#### General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor				
00217	Kjeldahl Nitrogen	EPA 351.2	1	14215108101B	08/05/2014 14:1	4 Joseph E McKenzie	1				
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	14215118101B	08/03/2014 20:2	2 Joseph E McKenzie	1				
00227	Total Phosphorus as P (water)	EPA 365.1	1	14217109101A	08/07/2014 15:0	5 Venia B McFadden	1				
06165	Total NO2/NO3/TKN	SM 4500 N-1999	1	14215108101B	08/05/2014 14:1	4 Joseph E McKenzie	1				
01460	Total Kjeldahl Nitrogen Digest	EPA 351.2	1	14215108101B	08/03/2014 16:2	•					
08263	Total Phos as P Prep (water)	EPA 365.1	1	14217109101A	08/05/2014 10:4	Nancy J Shoop	1				
08079	HEM (oil & grease)	EPA 1664A	1	14212807901A	07/31/2014 09:1	8 Yolunder Y Bunch	1				



# Lancaster Laboratories Environmental

# **Analysis Report**

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Sample Description: Outfall 001 Grab Groundwater

Fairfax Terminal Complex

LL Sample # WW 7549163

LL Group # 1492586 Account # 08390

Project Name: Fairfax Terminal Complex

Collected: 07/29/2014 13:30 by JP

GES, Inc.

Suite A

1350 Blair Dr

Submitted: 07/30/2014 16:15 Reported: 08/08/2014 11:43

Odenton MD 21113

#### Laboratory Sample Analysis Record

			2					
CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
04001	Chemical Oxygen Demand	EPA 410.4	1	14213400101A	08/01/2014	06:55	Susan A Engle	1
10457	Total Suspended Solids	SM 2540 D-1997	1	14214145701A	08/02/2014	08:31	Hannah M Royer	1
00235	Biochemical Oxygen Demand	SM 5210 B-2001	1	14211023502A	07/30/2014	20:23	Hannah M Royer	1

# Lancaster Laboratories Environmental

# **Analysis Report**

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Page 1 of 2

# Quality Control Summary

Client Name: GES, Inc. Group Number: 1492586

Reported: 08/08/14 at 11:43 AM

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

#### Laboratory Compliance Quality Control

Analysis Name	Blank <u>Result</u>	Blank MDL	Report <u>Units</u>	LCS %REC	LCSD %REC	LCS/LCSD <u>Limits</u>	RPD	RPD Max
Batch number: 14215108101B Kjeldahl Nitrogen	Sample numbe	er(s): 754 0.50	9163 mg/l	99		90-110		
Batch number: 14215118101B Total Nitrite/Nitrate Nitrogen	Sample number N.D.	er(s): 754 0.040	9163 mg/l	108		90-110		
Batch number: 14217109101A Total Phosphorus as P (water)	Sample numbe	er(s): 754 0.080	9163 mg/l	109		90-110		
Batch number: 14211023502A Biochemical Oxygen Demand	Sample numbe	er(s): 754	9163	84*		85-115		
Batch number: 14212807901A HEM (oil & grease)	Sample numbe	er(s): 754 1.4	9163 mg/l	103	85	78-114	19*	16
Batch number: 14213400101A Chemical Oxygen Demand	Sample numbe	er(s): 754 12.8	9163 mg/l	98		94-110		
Batch number: 14214145701A Total Suspended Solids	Sample numbe	er(s): 754 1.00	9163 mg/l	96		91-105		

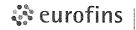
### Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD <u>MAX</u>	BKG Conc	DUP Conc	DUP RPD	Dup RPD
Batch number: 14215108101B Kjeldahl Nitrogen	Sample 99	number(s)	: 7549163 90-110	UNSPK:	P54847	73 BKG: N.D.	P548473 N.D.	0 (1)	20
Batch number: 14215118101B Total Nitrite/Nitrate Nitrogen	Sample 99	number(s)	: 7549163 90-110	UNSPK:	754916	3 BKG: N.D.	7549163 N.D.	0 (1)	2
Batch number: 14217109101A Total Phosphorus as P (water)	Sample 115*	number(s)	: 7549163 90~110	UNSPK:	754916	3 BKG: N.D.	7549163 N.D.	0 (1)	4
Batch number: 14211023502A Biochemical Oxygen Demand	Sample 68	number(s) 70	: 7549163 59-139	UNSPK:	P54913	88 BKG: 206	P549137 197	4	15
Batch number: 14212807901A	Sample	number(s)	: 7549163	UNSPK:	P54884	14			

## \*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



# Lancaster Laboratories Environmental

# **Analysis Report**

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Page 2 of 2

# Quality Control Summary

Client Name: GES, Inc.

Group Number: 1492586

Reported: 08/08/14 at 11:43 AM

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name HEM (oil & grease)	<b>MS</b> <u>%REC</u> 91	MSD %REC	MS/MSD Limits 78-114	RPD	RPD MAX	BKG Conc	DUP <u>Conc</u>	DUP RPD	Dup RPD Max
Batch number: 14213400101A Chemical Oxygen Demand	Sample 90	number(s)	: 7549163 90-110	UNSPK:	P5491	37 BKG: P5 610	49137 627	3 (1)	9
Batch number: 14214145701A Total Suspended Solids	Sample	number(s)	: 7549163	BKG:	P54823	7 7,320	7,220	1	5

<sup>\*-</sup> Outside of specification

<sup>(1)</sup> The result for one or both determinations was less than five times the LOQ.

<sup>(2)</sup> The unspiked result was more than four times the spike added.

# Environmental Analysis Request/Chain of Custody

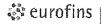
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Project Manager:	Greg Reichart	P.O. #:				<u></u>	g ug					- Company of State		o de compresentado de la c					SCR #:		
Sampler: Jeff Plum	ımer	PWSID#:				Sediment	Ground		(0			- Annual Company of the Company of t	- CONTRACTOR OF THE CONTRACTOR	elogentraticon			***************************************		Pro	eservation Codes	SCHOOL STREET
Phone #: (800) 220	)-3606 x 3717	Quote #:				Sed			iner	ģ					SI				H = HCl	T = Thiosulfate	
State where sample	e(s) were collected: Virgi	inia					ble		onta	540	Grease			03)	lorot				N = HNO <sub>3</sub>	B = NaOH	
		Colle	ction	q	Composite		Potable er NPDES	:10	Total # of Containers	S (SIM 2540 D 7)	ਰੂ	75	0	Total nitrogen (TKN/NO2/NO3)	Total phosphorous		***************************************		S = H <sub>2</sub> SO <sub>4</sub> O = Other	P = H <sub>3</sub> PO <sub>4</sub>	
Sample Identifica	ation	Date	Time	Grab	S	Soil	Water	Other:	Tota	1SS 1997)	ō	BOD5	COD	PR X	Tota					Remarks .	
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Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300

LF 7/31/14

7045 0713



Lancaster Laboratories Environmental

# Sample Administration Receipt Documentation Log

Doc Log ID:

21856

Group Number(s): 1492586

Client: GES

Outfall 001

Delivery Method: <u>ELL</u>	<u>E Courier</u>	Arrival Timestamp:	07/30/2014	<u>16:15</u>
Number of Packages: 1		Number of Projects:	<u>3</u>	
State/Province of Origin: <u>VA</u>				
	Arrival Co	ndition Summary		
Shipping Container Sealed:	<u>No</u>	Total Trip Blank Qty:		<u>0</u>
Custody Seal Present:	<u>No</u>	Trip Blank Type:		<u>N/A</u>
Custody Seal Intact:	<u>N/A</u>	Air Quality Samples Pro	esent:	<u>No</u>
Samples Chilled:	<u>Yes</u>	Air Quality Flow Contro	llers Present:	<u>N/A</u>
Paperwork Enclosed:	<u>Yes</u>	Flow Controller Quantit	y:	<u>0</u>
Samples Intact:	<u>Yes</u>	Air Quality Returns:		<u>N/A</u>
Missing Samples:	<u>No</u>			
Extra Samples:	<u>No</u>			
Discrepancy in Container Qty on C	COC: <u>No</u>			
Sample IDs on COC match Conta	niners: <u>Yes</u>			
Sample Date/Times match COC:	Yes			
VOA Vial Headspace ≥ 6mm:	N/A			
VOA IDs ( ≥ 6mm):	<u>N/A</u>			
Unpacked by Patrick Engle (3472)				

## Samples Chilled Details: Outfall 001

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Samples Carr

Cooler # Thermometer ID Corrected Temp Therm. Type Ice Type Ice Present? Ice Container Day as Receipt? Elevated Temp?

1 DT131 2.2 DT Wet Y Bagged N N



Lancaster Laboratories Environmental

# **Explanation of Symbols and Abbreviations**

The following defines common symbols and abbreviations used in reporting technical data:

_	_	•	•
RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
С	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
μg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	Ĺ	liter(s)
m3	cubic meter(s)	μL	microliter(s)
		pg/L	picogram/liter

- less than The number following the sign is the <u>limit of quantitation</u>, the smallest amount of analyte which can be reliably determined using this specific test.
- > greater than
- ppm parts per million One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
- ppb parts per billion
- Dry weight basis

Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Data Qualifiers:

C - result confirmed by reanalysis.

J - estimated value - The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

	Organic Qualifiers		Inorganic Qualifiers
Α	TIC is a possible aldol-condensation product	В	Value is <crdl, but="" th="" ≥idl<=""></crdl,>
В	Analyte was also detected in the blank	E	Estimated due to interference
C	Pesticide result confirmed by GC/MS	M	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	N	Spike sample not within control limits
E	Concentration exceeds the calibration range of	S	Method of standard additions (MSA) used
	the instrument		for calculation
N	Presumptive evidence of a compound (TICs only)	U	Compound was not detected
P	Concentration difference between primary and	W	Post digestion spike out of control limits
	confirmation columns >25%	*	Duplicate analysis not within control limits
U	Compound was not detected	+	Correlation coefficient for MSA < 0.995
X,Y,Z	Defined in case narrative		

#### Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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#### ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601

GES, Inc. Suite A 1350 Blair Dr Odenton MD 21113

August 22, 2014

Project: Fairfax Terminal Complex

Submittal Date: 08/15/2014 Group Number: 1496491 PO Number: FAIRFAX TERMINAL State of Sample Origin: VA

Client Sample Description
Outfall 901 Grab Water

Lancaster Labs (LL) #

7567323

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC

GES, Inc.-MD

Attn: Jenna Laube

COPY TO ELECTRONIC

GES, Inc.-MD

Attn: Report Distribution

COPY TO ELECTRONIC

GES

Attn: Greg Reichart

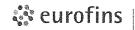
COPY TO

Zyn M. Frederiksen

Respectfully Submitted,

Principal Specialist Group Leader

(717) 556-7255



# Lancaster Laboratories Environmental

# **Analysis Report**

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: Outfall 901 Grab Water

Fairfax Terminal Complex

LL Sample # WW 7567323 LL Group # 1496491 Account # 08390

Project Name: Fairfax Terminal Complex

Collected: 08/12/2014 15:30

GES, Inc.

Suite A

Submitted: 08/15/2014 16:08

Reported: 08/22/2014 08:38

1350 Blair Dr Odenton MD 21113

#### 9010-

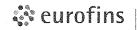
CAT No. Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC Petroleum Hydrocarbons	SW-846 8015C Feb 2007 Rev 3	mg/l	mg/l	
13163 DRO C10-C28	n.a.	0.056 J	0.043	1
Wet Chemistry	SM 2540 D-1997	mg/l	mg/l	
10457 Total Suspended Sol	ids n.a.	24.4	2.00	1

#### General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

			-	* 2				
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	<b>e</b>	Analyst	Dilution Factor
13163	DRO 8015C/D, MicroExt.	SW-846 8015C Feb 2007 Rev 3	1	142280019A	08/18/2014 1	18:03	Christine E Dolman	1
13175	MicroExt. 3511 (8015C/D)	SW-846 3511	1	142280019A	08/17/2014 1	14:20	Wanda F Oswald	1
10457	Total Suspended Solids	SM 2540 D-1997	1	14231145701B	08/19/2014 1	13:39	Yolunder Y Bunch	1



## Lancaster Laboratories Environmental

# **Analysis Report**

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Page 1 of 1

## Quality Control Summary

Client Name: GES, Inc.

Group Number: 1496491

Reported: 08/22/14 at 08:38 AM

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

#### Laboratory Compliance Quality Control

Analysis Name	Blank <u>Result</u>	Blank MDL	Report <u>Units</u>	LCS %REC	LCSD %REC	LCS/LCSD <u>Limits</u>	RPD	RPD Max
Batch number: 142280019A DRO C10-C28	Sample numb	er(s): 75	67323 mg/l	95	95	56-122	1	20
Batch number: 14231145701B Total Suspended Solids	Sample numb	er(s): 75	67323 mg/l	98		91-105		

### Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD <u>Limits</u>	RPD	RPD MAX	BKG <u>Conc</u>	DUP <u>Conc</u>	DUP RPD	Dup RPD
Batch number: 14231145701B Total Suspended Solids	Sample	number(s	): 7567323	BKG:	P56741	1 74.2	76.9	4	5

#### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: DRO 8015C/D, MicroExt.

Batch number: 142280019A

#### Orthoterphenyl

***************************************						
7567323	116					
Blank	124					
Blank LCS	121					
LCSD	116					
Limits:	50-150					

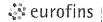
#### \*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

# Environmental Analysis Request/Chain of Custody

eurorins	Lancaster Laboratories Environmental				Acc	ct, #_ <b>(</b>	390	)	Group #	,14°	9649	71	Samı	 ole #	751	67	37	23				
Client: Joint Ba	asin Corporation	NATIONAL PROPERTY.		trillation (miles see o	CONTRACTOR EN	T	Matrix		-	T	ories escape and a second		niemetranisische	GEGGGGGGGGG	quest				1	For Lab Us	na Only	
Project Name/#:	Fairfax Terminal Complex	Site ID #:			-	$I_{T}$		<u> </u>	1	CONTRACTOR IN		de la	W.70516764600:3	THE STATE OF THE S	n Cod		CAROLING CO.	Albino de constante	Sicremonium Sicremonium		-	
Project Manager:	Greg Reichart	P.O. #:		*			- Q			-	Тн	P I	Teserv	vauo T	n cou	es T		***************************************	Samesanse (	SF #:		
					*******	1en	Ground Surface					***************************************	-	ļ	-		***************************************	***************************************		SCR #:		Automoseum
Sampler: Jeff Plum		PWSID #:		*************	***************************************	Sediment	•	•	Sign		S (S)								- Anna	Pres	servation Codes	
Phone #: (800) 220	***************************************	Quote #:				Ň			tain		(EPA SW- 8015C)								and the second	H ≃ HCI	T = Thiosulfate	
State where sample	(s) were collected: Virgi	nia T		T	Tanaman Tanaman	<b> </b>	Potable NPDES	ļ.,	000	2540 D-	0 0								Physical Physics (1971)	N = HNO <sub>3</sub>	B = NaOH	
Activities of the second secon		Colle	ction	٩	Сотроѕіє		1	er:	Total # of Containers	SIM	TRPH-DRO ( 846 Method 8								8	S = H <sub>2</sub> SO <sub>4</sub> O = Other	$P = H^2 PO^4$	
Sample Identifica	ation	Date	Time	Grab	5	Soil	Water	Other:	Tota	TSS (	TR 846							l		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Remarks	tions-probable
Outfall 901		81214	1530	Х			х		4	Х	X	1	1			1	7		1	E-mail EQE	DD to	
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Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300



Lancaster Laboratories Environmental

# Sample Administration Receipt Documentation Log

Doc Log ID:

24473

Group Number(s): 1496491

Client: Joint Basin Corporation

**Delivery and Receipt Information** 

**Delivery Method: ELLE Courier**  Arrival Timestamp:

08/15/2014 16:08

Number of Packages:

1

Number of Projects:

1

State/Province of Origin:

<u>VA</u>

**Arrival Condition Summary** 

Shipping Container Sealed:

No No Total Trip Blank Qty:

0

Custody Seal Present:

N/A

Trip Blank Type:

<u>N/A</u>

**Custody Seal Intact:** 

Air Quality Samples Present:

No

Samples Chilled: Paperwork Enclosed: Yes <u>Yes</u> Air Quality Flow Controllers Present: Flow Controller Quantity:

N/A 0

Samples Intact:

Yes

Air Quality Returns:

N/A

Missing Samples: Extra Samples:

No <u>No</u>

Discrepancy in Container Qty on COC:

No

Sample IDs on COC match Containers:

<u>Yes</u>

Sample Date/Times match COC:

VOA Vial Headspace ≥ 6mm:

Yes

VOA IDs ( $\geq$ 6mm):

No <u>N/A</u>

Unpacked by Wesley Miller (2308) at 17:01 on 08/15/2014

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Samples Collected Same

Cooler# Thermometer ID Corrected Temp

Therm. Type

Ice Type

Ice Present?

Ice Container

Day as Receipt?

Elevated Temp?

DT121

1.7

DT

Wet

Bagged



Lancaster Laboratories Environmental

# **Explanation of Symbols and Abbreviations**

The following defines common symbols and abbreviations used in reporting technical data;

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
С	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
μg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	Ĺ	liter(s)
m3	cubic meter(s)	μL	microliter(s)
		pg/L	picogram/liter

- < less than The number following the sign is the <u>limit of quantitation</u>, the smallest amount of analyte which can be reliably determined using this specific test.
- > greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billior

Dry weight basis

Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Data Qualifiers:

C - result confirmed by reanalysis.

J - estimated value - The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

	Organic Qualifiers		Inorganic Qualifiers
Α	TIC is a possible aldol-condensation product	В	Value is <crdl, but="" th="" ≥idl<=""></crdl,>
В	Analyte was also detected in the blank	E	Estimated due to interference
C	Pesticide result confirmed by GC/MS	M	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	N	Spike sample not within control limits
E	Concentration exceeds the calibration range of	S	Method of standard additions (MSA) used
	the instrument		for calculation
N	Presumptive evidence of a compound (TICs only)	U	Compound was not detected
Р	Concentration difference between primary and	W	Post digestion spike out of control limits
	confirmation columns >25%	*	Duplicate analysis not within control limits
U	Compound was not detected	+	Correlation coefficient for MSA < 0.995
X,Y,Z	Defined in case narrative		

## Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



# INTERMITTENT FLOWS TO THE JBC BASIN

Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22301

Outfall Number	Company	Intermittent Flow	Frequency	Flow Rate (gpm)	Duration (hours)
106	BUCKEYE	Hydrostatic Test Discharge Water	Approx. 1 per 5 years	444	168
106	CITGO	Hydrostatic Test Discharge Water	Varies up to 1 per year	350	240
106	TRANSMONTAIGNE	Hydrostatic Test Discharge Water	Varies up to 2 per year	240	240

Notes:

1. gpm = gallons per minute

#### TABLE A-5



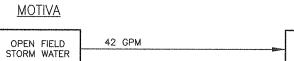
#### **TERMINAL FLOW CALCULATIONS**

Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22301

		Average	
Company	Operation	Flow	Flow Basis
		(gpm)	
BUCKEYE	Grassy/Bermed Area Storm Water	29	Volume of the storm water generated in area B3 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-1)
	Tank Dike Area and Perimeter Storm Water	825	Volume of the storm water generated in area B1 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-1)
	Office/Parking Area Storm Water	556	Volume of the storm water generated in area B2 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-1)
	Loading Rack Canopy Storm Water	21	Estimated percentage of the volume of storm water generated in area B2 during the 10 year storm (3.9%) divided by the duration of the runoff (26 hours). (See Table B-1)
	Office Wastewater	4	Estimated by Buckeye.
	Maintenance Bay Drain Water	2.5	Estimated water discharge through a maintenance bay floor drain (300 gallons) divided by estimated duration of discharge (2 hours).
	Fire Test and Spill Cleanup Water	1010	Estimated water discharge during a fire test (5,000 gallons) divided by the duration of the test (5 minutes) plus estimated water to cleanup a spill (100 gallons) divided by the cleanup time (10 minutes).
	Loading Rack Floor Drains Storm Water	14	Estimated percentage (2.5%) of the volume of storm water generated in area B2 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-1)
	Remediation Groundwater	4.7	Estimated water generated during monthly monitoring activities (1,400 gallons) divided by time to pump it to a vacuum truck (5 hours).
	Hydrostatic Test Discharge Water	444	Volume of largest aboveground storage tank (4,478,628 gallons) to be tested and discharged during the permit period divided by the duration of the discharge (1 week).
·	Tank Bottom Water	10.4	Volume of the average amount of tank bottom water generated per tank (2,500 gallons) divided by the duration of discharge (4 hours).
CITGO	Hydrostatic Test Discharge Water	350	Volume of largest aboveground storage tank (5,035,000 gallons) to be tested and discharged during the permit period divided by the duration of the discharge (10 days).
	Office, Parking Area Storm Water	142	Volume of the storm water generated in areas C1 and C2 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-2)
	Open Field Storm Water and Diked Tank Area Water	494	Volume of the storm water generated in areas C3, C4, C5, and C6 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-2)
	Loading Rack Storm Water	10	Estimated percentage of the volume of storm water generated in area C2 during the 10 year storm (9.4%) divided by the duration of the runoff (26 hours). (See Table B-2)
	Fire Test and Spill Cleanup Water	510	Estimated water discharge during a fire test (5,000 gallons) divided by the duration of the test (10 minutes) plus estimated water to cleanup a spill (100 gallons) divided by the cleanup time (10 minutes).
	Tank Bottom Water	33	Volume of the average amount of tank bottom water generated per tank (2,000 gallons) divided by the duration of discharge (1 hour).
	Office Wastewater	4	Estimated by CITGO.
TRANSMONTAIGNE	Office, Parking Area, and Perimeter Storm Water	130	Volume of the storm water generated in areas T2 and T3 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-3)
	Open Space Storm Water French Drains	131	Volume of the storm water generated in area T1 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-3)  Intermittent flow.
	Bermed Tank Area Storm Water	535	Volume of the storm water generated in area T4 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-3)
	Truck Parking Area and Loading Rack Storm Water	202	Volume of the storm water generated in area T5 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-3)
	Fire Test and Spill Cleanup Water	510	Estimated water discharge during a fire test (5,000 gallons) divided by the duration of the test (10 minutes) plus estimated water to cleanup a spill (100 gallons) divided by the cleanup time (10 minutes).
	Tank Bottom Water	262	Volume of the average amount of tank bottom water generated per tank (15,700 gallons) divided by the duration of discharge to trucks for offsite disposal (1 hour).
	Monitoring Groundwater	0.5	Estimated water generated during monitoring activities (275 gallons) divided by time to pump it (8 hours).
	Office/Warehouse Wastewater	2	Estimated by TransMontaigne.
	Hydrostatic Test Discharge Water	240	Volume of largest aboveground storage tank (3,455,284 gallons) to be tested and discharged during the permit period divided by the duration of the discharge (10 days).
MOTIVA	Open Field Storm Water	42	Volume of the storm water generated in areas M1 and M2 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-4)

Notes:

1. gpm = gallons per minute



RAINWATER

STORM WATER IMPOUNDMENT BASIN

aphics/0400-Croftonliffisculoint Basin CorporationUBC- fairfax DISCHARGE FLOW DIA.dwg. (7-3)/2-5) MOTI

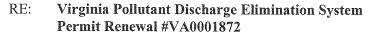
DRAFTED BY: E.V. (N.J.)	SCHEMATI	R MANAGEMENT C DIAGRAM	1
CHECKED BY:	FAIRFAX TERM	CORPORATION INAL COMPLEX	
REVIEWED BY:		VIAL AVENUE VIRGINIA	
**************************************	Groundwater & Environ 1350 BLAIR DRIVE, SUITE		
		DATE	FIGURE
	NOT TO SCALE	8-29-14	7-3



1350 Blair Drive, Suite A, Odenton, MD 21113 • (800) 220-3606 • FAX (410) 721-3733

July 14, 2014

Ms. Elizabeth Biller Water Permit Writer Virginia Department of Environmental Quality 13901 Crown Court Woodbridge, Virginia 22193



Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22031

Dear Ms. Biller:

Attached are hard copies for the following information requested in your letter dated July 10, 2014:

- Form 1 Section XIII Certification:
- Form 2C Section IX Certification;
- Form 2F Section V.A Certification; and
- Form 2F Section X.C,D Certification.

GES appreciates the continued guidance of the DEQ on this project. If you have any questions or would like additional information please contact the undersigned at 800-220-3606, extension 3254 or 3717, respectively, or Mike Younce of Buckeye at (703) 503-3687.

Sincerely,

Groundwater & Environmental Services, Inc.

Jenna Laube

Remediation Specialist

Gregory Reichart Project Manager

c: Mike Younce, Buckeye Terminals, LLC (Buckeye)

Peter Adamczyk, Citgo Petroleum Corporation (Citgo)

Susan Horning, Motiva Enterprises, LLC (Motiva)

George Conover, TransMontaigne, Inc. (TransMontaigne)

File, GES PSID #498017



CONTINUED FROM THE FRONT	
VII. SIC CODES (4-digit, in order of priority)  A. FIRST  B. SECOND	
7 5171 (specify) 7 5171 (specify) 7 N/A (specify)	- /Addison-
15   16   19	
7 N/A (Specify)  7 N/A (Specify)  15 16 19	
VIII. OPERATOR INFORMATION  A. NAME	B.Is the name listed in Item
8 Joint Basin Corporation	VIII-A also the owner? ☑ YES ☐ NO
C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box: if "Other," specify.)	D. PHONE (area code & no.)
	c
E. STREET OR P.O. BOX 9601 Colonial Avenue	
26 55	
B Fairfax VA 22031 TY	NDIAN LAND e facility located on Indian lands? 'ES
15 16 40 41 42 47 - 51 52	
X. EXISTING ENVIRONMENTAL PERMITS	
A. NPDES (Discharges to Surface Water)  D. PSD (Air Emissions from Proposed Sources)  O. T. I.	
15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 30 15 16 17 18 18 30 15 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18	Albanda ya Milati k
Solo (who have the solo (specify)	
15 16 17 18 30 15 16 17 18 30	
C. RCRA (Hazardous Wastes)  E. OTHER (specify)	
9 R N/A 9 N/A	
15 18 17 18 30 15 16 17 16 30 XI. MAP	
Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must s location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposi	al facilities, and each wall where it
injects fluids underground. Include all springs, rivers, and other surface water bodies in the map area. See instructions for precise requirer	nents. See Figure 1
XII. NATURE OF BUSINESS (provide a brief description)	:
The Joint Basin Corporation is co-owned by four petroleum companies that operate at the Fa (Buckeye Terminals, LLC, CITGO Petroleum Corporation, Motiva Enterprises, LLC, and TransMc Operations consist of receiving product via the Colonial Pipeline and distributing product the Colonial Pipeline.	ontaigne, Inc.).
VIII CERTIFICATION (see instructions)	
XIII. CERTIFICATION (see instructions)	ttoohmonto orditat t
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all a inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.	
A. NAME & OFFICIAL TITLE (type or print)  Michael Younce (President)  B. SIGNATURE	C. DATE SIGNED
Most Morn	7/14/14
COMMENTS FOR OFFICIAL USE ONLY	
15 16	55

# CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA	A		
relation to your discharge within the last 3 ye			scharges or on a receiving water in
$\checkmark$ YES (identify the test(s) and de	scribe their purposes below)	NO (go to Section 1711)	
See Form 2F			
VIII. CONTRACT ANALYSIS INFORMATION			
Were any of the analyses reported in Item V	performed by a contract laboratory or consulting firm?		
VES that the name address an	d telephone number of, and pollutants analyzed by,	NO (go to Section IX)	
each such laboratory or fir		La no (go ro section (x)	
A. NAME	B. ADDRESS	C. TELEPHONE (area code & no.)	D. POLLUTANTS ANALYZED (list)
Eurofins Lancaster Laboratories Environmental	2425 New Holland Fike, Lancaster PA	(717)656-2300	Volatile, Acid,
IX. CERTIFICATION			
I certify under penalty of law that this docum qualified personnel properly gather and eve directly responsible for gathering the informa are significant penalties for submitting false	nent and all attachments were prepared under my dire aluate the information submitted. Based on my inqui ation, the information submitted is, to the best of my k information, including the possibility of fine and imprise	ry of the person or persons who re nowledge and belief, true, accurate	nanage the system or those nersons
A. NAME & OFFICIAL TITLE (type or print)	The state of the s	3. PHONE NO. (area code & no.)	
Michael Younce (President)		(703) 503-3687	
C. SIGNATURE / // /	] [	D. DATE SIGNED	ē.
Mars L Al.	d arrange	7/14	//4

EPA Form 3510-2C (8-90)

Continued from the Front

IV. Narra	tive Description of Polluta	nt Sources			
A. For ead draine	ch outfall, provide an estimate of the area d by the outfall.	(include units) of imperious surface	es (including p	aved areas and building roofs) drained to the outfall, and	I an estimate of the total surface are
Outfali Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)	Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)
901	53.2 acres	106.4 acres	N/A	N/A	N/A
to stor	m water; method of treatment, stora water runoff; materials loading and a	ige, or disposal; past and pre	sent materia	three years have been treated, stored or dispose als management practices employed to minimize and frequency in which pesticides, herbicides, soi	contact by these materials wi
See narra	ative included in Appendix F	3. Also see Table 2.			
descr	ach outfall, provide the location and iption of the treatment the storm wat a solid or fluid wastes other than by d	er receives, including the sch	actural and redule and ty	nonstructural control measures to reduce pollutar rpe of maintenance for control and treatment mea	nts in storm water runoff; and asures and the ultimate dispos
Outfall Number		Ī	reatment		List Codes from Table 2F-1
	See Table 3.				
V. Nc₁nst	ormwater Discharges			Control of the Contro	
A. I certii nonst	fy under penalty of law hat the outfa ormwater discharged from these outf	ill(s) covered by this application fall(s) are identified in either are	on have bee n accompan	n tested or evaluated for the presence of nonstorying Form 2C or From 2E application for the outfa	rmwater discharges, and that a all.
	Official Title (type or print)	Signature Mids & U	lein		Date Signed
				inage points that were directly observed during a	
non-scorm prepared	water discharges have been for the facility. These re	identified and evaluateports were submitted t	ted in ris	Ek assessment and site characterizati ? prior to 1994.	on reports previously
	ficant Leaks or Spills				
Provide approxim	existing information regarding the hate date and location of the spill or le	nistory of significant leaks or eak, and the type and amount	spills of to	xic or hazardous pollutants at the facility in the released.	last three years, including th
See Table	4.				

### Continued from Page 2

VII. Discharge Information			
	oceeding. Complete one set of tables for each outfall. As a included on separate sheets numbers VII-1 and VII-		pace provided.
Potential discharges not covered by a currently use or manufacture as an inter-	analysis – is any toxic pollutant listed in table 2F-2, ermediate or final product or byproduct?	2F-3, or 2F-4, a substance or a c	component of a substance which you
✓ Yes (list all such pollutants b		No (go to Section IX)	
See parts A, B, C, and D on next	£-5		
VIII. Biological Toxicity Testing D	Data (1997)		
	believe that any biological test for acute or chronic tox years?	icity has been made on any of you  No (go to Section IX)	r discharges or on a receiving water in
See Appendix C.	eiow j	[ ] NO (go to section ix)	
	Ł .		
IX. Contract Analysis Information			
	VII performed by a contract laboratory or consulting fi	rm?	
Yes (list the name, address, analyzed by, each such	and telephone number of, and pollutants laboratory or firm below)	No (go to Section X)	
A. Name	B. Address	C. Area Code & Phone No.	D. Pollutants Analyzed
Air, Water, and Soil Laboratories, Inc.	2109A North Hamilton Street, Richmond, VA 23230	(804) 358-8295	See Appendix C.
Coastal Bioanalysts, Inc.	6400 Enterprise Court, Gloucester, VA 23061	(804) 694-8285	The control of the co
Eurofins Lancaster Laboratories Environmental	2425 New Holland Pike, Lancaster, PA 17601	(717) 656-2300	of the property of the propert
James R. Reed & Associates	770 Pilot House Drive, Newport News, VF 23606	A (757) 873-4703	
TestAmerica Laboratories, Inc.	2960 Foster Creighton Drive, Nashville, TN 37204	(615) 726-0177	
X. Certification			
that qualified personnel properly gather an directly responsible for gathering the infor	ument and all attachments were prepared under my d evaluate the information submitted. Based on my in mation, the information submitted is, to the best of r g false information, including the possibility of fine and	iquiry of the person or persons who my knowledge and belief, true, acc	manage the system or those persons urate, and complete. I am aware that
A. Name & Official Title (Type Or Print)		B. Area Code and Phone No.	
Mike Younce (President)  C. Signature	<u> </u>	(703) 503-3687	
Machi I ber		D. Date Signed	

EPA Form 3510-2F (1-92)

1350 Blair Drive, Suite A, Odenton, MD 21113 • (800) 220-3606 • FAX (410) 721-3733

June 27, 2014

Ms. Elizabeth Biller Water Permit Writer Virginia Department of Environmental Quality 13901 Crown Court Woodbridge, Virginia 22193

RE: Virginia Pollutant Discharge Elimination System Permit Renewal #VA0001872

Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22031

Dear Ms. Biller:

Attached is a permit renewal application for Virginia Pollutant Discharge Elimination System (VPDES) Permit No.VA0001872 for the above-referenced facility.

The following changes to the previous permit are proposed for review and discussion:

- Removal of Outfall 103 as a sampled internal outfall (A.3. of the permit);
- Written approval for field testing of residual chlorine for Outfall 106 (A.5. of the permit) and revision of maximum limit (A.5 of the permit) to match the required Quantification Limit (B.1.a of the permit);
- Revision of biological sample collection from 24-hour flow-proportioned composite to 24-hour time-weighted composite sample, in accordance with 8.3.4.1 of EPA *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (revision of C.1.a of the permit);
- Written approval to collect storm water samples approximately 24 hours after a measurable rain event, to allow for the representative discharge to reach the outfall (revision of C.3.a. and D.1.a. of the permit);
- Duplicate use of Outfall 901 analytical data as a representative discharge for Outfall 001 reporting data when sampled in the same month (approval under D.1.d of the permit); and
- Update of Storm Water Pollution Prevention Team to include Colonial Pipeline (D.2.b.1 of the permit).

GES appreciates the continued guidance of the DEQ on this project. If you have any questions or would like additional information please contact the undersigned at 800-220-3606, extension 3254 or 3717, respectively, or Mike Younce of Buckeye at (703) 503-3687.



Sincerely,

**Groundwater & Environmental Services, Inc.** 

Jenna Laube

Remediation Specialist

Gregory Reichart Project Manager

c: Mike Younce, Buckeye Terminals, LLC (Buckeye)

Peter Adamczyk, Citgo Petroleum Corporation (Citgo) Susan Horning, Motiva Enterprises, LLC (Motiva) George Conover, TransMontaigne, Inc. (TransMontaigne)

File, GES PSID #482279

# Virginia Pollutant Discharge Elimination System

# Permit Renewal Application VA0001872

Storm Water Impoundment Basin Fairfax Terminal Complex Fairfax, VA

Prepared for:

Joint Basin Corporation 9601 Colonial Avenue Fairfax, VA 22031

Submitted to:

Commonwealth of Virginia
Department of Environmental Quality
Northern Regional Office
13901 Crown Court
Woodbridge, VA 22193

Prepared by:



Groundwater & Environmental Services, Inc. 1350 Blair Drive, Suite A Odenton, MD 21113

June 2014



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Table 6 Discharge Information (5-Year Attachment A Sampling)



# EPA FORM 1

Form	Annroyad	OMB No	2040-0086

	i in the unshau		<u> </u>		DDOTEOT			1	Approved. ONB 140. 2040-0	500.	_		
FORM	O EDA	U.S. ENVIRO			IFORMA			I. El	PA I.D. NUMBER			T/A	С
1	<b>\$EPA</b>				Permits Prog			F				.,,,	D
GENERAL		(Read the '	'Gener	al Instr	uctions" befo	ore	e starting.)	1	2		13	14	15
LABEI	ITEMS								GENERAL INSTRU preprinted label has been	provide	d, affix		
I. EPA I.D.	NUMBER							is in	gnated space. Review the inform correct, cross through it and entropriate fill-in area below. Also, if	ter the any of	correct the pre	data ii printed	in the I data
III. FACILITY	' NAME	PLEASE	PLA	CE LA	BEL IN THIS	s s	SPACE	info	bsent (the area to the left of mation that should appear), plean area(s) below. If the label is of	se prov	vide it ir	the p	roper
V. FACILITY ADDRES	' MAILING S							nee	d not complete Items I, III, V, a t be completed regardless). Con	nd VI ( nplete a	(except all items	VI-B v s if no	which label
VI. FACILITY		-						des	been provided. Refer to the inscriptions and for the legal author is collected.				
II. POLLUTANT	CHARACTERIS	TICS											
submit this formation you answer "no	m and the supple o" to each question	nrough J to determine whethe mental form listed in the pare on, you need not submit any o of the instructions for definiti	nthesi f these	is follo e forms	wing the qu s. You may faced terms	ies an	tion. Mark "X" in the box in	the th	nird column if the supplemer	ntal for	m is a	ttache n C o	ed. If
	SPECIFIC QL	JESTIONS	YES	NO	FORM ATTACHED		SPECIFIC	C QUE	ESTIONS	YES	NO	FOI ATTA	
		ned treatment works which ers of the U.S.? (FORM 2A)				В	include a concentrated aquatic animal produc	anin	her existing or proposed) nal feeding operation or facility which results in a				
C le this a fac	ility which curren	itly results in discharges to	16	17	18	Г	discharge to waters of the		S.? (FORM 2B)  r than those described in A	19	20	2	.1
	he U.S. other tha	in those described in A or B	22	23	24				a discharge to waters of	25	26	2	27
	ill this facility t	reat, store, or dispose of 3)				F	municipal effluent be	low	t this facility industrial or the lowermost stratum or mile of the well bore,				
			28	29	30		underground sources of c			31	32	3:	i3
or other fluction vinject fluids	uids which are with conventional used for enhance	s facility any produced water brought to the surface in oil or natural gas production, ed recovery of oil or natural age of liquid hydrocarbons?				Н	processes such as mining	g of surals, in	nis facility fluids for special ulfur by the Frasch process, in situ combustion of fossil energy? (FORM 4)				
	v a proposed stat	tionary source which is one	34	35	36	J	. Is this facility a propose	ed <b>st</b>	ationary source which is	37	38	31	19
of the 28 ind which will p pollutant reg	lustrial categories otentially emit 10 julated under the	listed in the instructions and 00 tons per year of any air Clean Air Act and may affect					NOT one of the 28 inc instructions and which w year of any air pollutant r	dustria vill po egula	al categories listed in the tentially emit 250 tons per ted under the Clean Air Act				
or be located	d in an attainment	t area? (FORM 5)	40	41	42		and may affect or be log (FORM 5)	ocate	d in an <b>attainment area</b> ?	43	44	45	15
III. NAME OF	FACILITY												
1 SKIP 15 16 - 29 30			•			•				69			
IV. FACILITY	CONTACT					İ	i						
С		A. NAME & TITLE (last	f, first,	& title)				E	3. PHONE (area code & no.)				
2 15 16							45	46	48 49 51 52- 5	55			
<b>-</b>	ILING ADDRESS	8					45	-10	70 T0 31 32° C				
		A. STREET OR P	.O. BC	ΟX									
3													
15 16		B. CITY OR TOWN					C. STATE	D 7	IP CODE				
c								1					
15 16							40 41 42 47		51				
VI. FACILITY		DEET DOUTENO OD OTHE	D 0 D		DENTIFIE	_							
5	A. 51F	REET, ROUTE NO. OR OTHE				=K							
15 16		B. COUNTY	/ NAM	IE		_	45						
46	1 1		1 7		1 1	T		70					
		C. CITY OR TOWN					D. STATE		P CODE F. COUNTY CO	ODE (	if know	n)	
6 15 16	1 1 1 1		-	1	1 1 1	ı	40 41 42 47	1	51 52	-54			

CONTINUED FROM THE FRONT		
VII. SIC CODES (4-digit, in order of priority)	D 05	COND
A. FIRST	-1 1 1 1	ECOND
(specify)	$\frac{c}{7}$ (specify)	
15 16 - 19	15 16 - 19	
C. THIRD		DURTH
(specify)	$\frac{ c }{7}$     (specify)	
15 16 - 19	15 16 - 19	
VIII. OPERATOR INFORMATION	10 10 - 10	
A. NA	AME	B.Is the name listed in Item
8		VIII-A also the owner?  ☐ YES ☐ NO  55 66
C. STATUS OF OPERATOR (Enter the appropriate	e letter into the answer how if "Other" specify)	D. PHONE (area code & no.)
	(specify)	c
F = FEDERAL S = STATE M = PUBLIC (other than federal or state)	re) (specify)	
P = PRIVATE  O = OTHER (specify)		
	56	15 6 - 18 19 - 21 22 - 26
E. STREET OR P.O. BOX		
26	55	
F. CITY OR TOWN	G. STATE   H. ZIP CO	DE IX. INDIAN LAND
B		Is the facility located on Indian lands?  ☐ YES ☐ NO
15 16	40 41 42 47 -	51
X. EXISTING ENVIRONMENTAL PERMITS		
A. NPDES (Discharges to Surface Water)	D. PSD (Air Emissions from Proposed Sources)	
9   N       9   P		
15 16 17 18 30 15 16 17	18 30	
B. UIC (Underground Injection of Fluids)	E. OTHER (specify)	
	_	cify)
9 U 9		
15 16 17 18 30 15 16 17		
C. RCRA (Hazardous Wastes)	E. OTHER (specify)	·C)
9 R	-	cify)
15 16 17 18 30 15 16 17	18 30	
XI. MAP		
Attach to this application a topographic map of the area extending to location of each of its existing and proposed intake and discharge stri		
injects fluids underground. Include all springs, rivers, and other surface		
, , ,	mater searce in the map area. See included in the product	o requirementer Occ 1 igure 1
XII. NATURE OF BUSINESS (provide a brief description)		
XIII. CERTIFICATION (see instructions)		
I certify under penalty of law that I have personally examined and am	familiar with the information submitted in this application	and all attachments and that based on my
inquiry of those persons immediately responsible for obtaining the infe	ormation contained in the application, I believe that the in	
am aware that there are significant penalties for submitting false inform	nation, including the possibility of fine and imprisonment.	
A. NAME & OFFICIAL TITLE (type or print)	. SIGNATURE	C. DATE SIGNED
" ' '		
COMMENTS FOR OFFICIAL LISE ONLY		
COMMENTS FOR OFFICIAL USE ONLY		



# **EPA FORM 2C**

(1177)

Form Approved. OMB No. 2040-0086. Approval expires 3-31-98.

Please print or type in the unshaded areas only.

2C SEPA

U.S. ENVIRONMENTAL PROTECTION AGENCY APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER

# EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURE OPERATIONS Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

N/A

A. OUTFALL NUMBER		B. LATITUDE		C	. LONGITUD	E	
(list)	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	D. RECEIVING WATER (name)
001/901	38	51	03	77	16	30	Unnamed tributary to Daniels Run
101	38	50	51	77	16	45	Storm Water Impoundment Basin
102	38	51	01	77	16	29	Storm Water Impoundment Basin
103	38	51	00	77	16	34	Storm Water Impoundment Basin
106	38	51	01	77	16	35	Storm Water Impoundment Basin

#### II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

- A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.a. for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

  See Figures 1-6
- B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUT-	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT					
FALL NO. (list)	a. OPERATION (list)	b. AVERAGE FLOW (include units)	a. DESCRIPTION	b. LIST COL TABLE	DES FROM 2C-1			
001/ 901	See Figures 2-6	See Appendix A	Sedimentation	1	Ū			
301								
101	See Figures 2-6	See Appendix A	Oil/Water Separator	1	K			
			Discharge to Surface Water	4	A			
102	See Figures 2-6	See Appendix A	Oil/Water Separator	1	K			
102			Discharge to Surface Water	4	A			
100	See Figures 2-6	See Appendix A	Discharge to Surface Water	4	A			
103		bee appendix a		**				
	See Figures 4-7		Discharge to Surface Water					
106	See Figures 4-7	See Appendix A	Bibonarge to Barrato mater	4	A			
05510141	LICE ONLY (-Glasset - vid-lines on least							

OFFICIAL USE ONLY (effluent guidelines sub-categories)

CONTINUED FF									,-				
	,	leaks, or sp lete the follo	,	of the di	ischarges des	cribed in It	ems II-A or B int		sonal?				
	120 (comp		wing table)			3. FRE	QUENCY	mon my		4. FLOV	V		
				a.	DAYS PER		- 510040	TE /: D			VOLUME		
1. OUTFALL NUMBER ( <i>list</i> )			PERATION(s) RIBUTING FLOV (list)	W		WEEK (specify average)	b. MONTHS PER YEAR (specify average)	a. FLOW RA 1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG T	TERM	2. MAXIMU DAILY	JM C. DURATIC
	See Tabl	e 1											
III. PRODUCTIO		ao limitation	promulgatos	l by ED	M under Section	on 204 of t	he Clean Water	Act apply to you	ur fooilitu?				
4. Does an en		lete Item III-		i by EP.	A under Section		$\overline{Z}$ NO (go to Sec		ir racility?				
B. Are the limit			_	eline ex	pressed in ter		uction (or other		ration)?				
C. If you arous	, 1	lete Item III-	,	atita e suda	ich represente		NO (go to Sec		araduation av	araaaad in	the t	arma and i	unito used in the
			dicate the aff			an actual	measurement	of your level of	production, ex	pressed in	the te	erms and t	inits used in the
			1. A\	/ERAG	E DAILY PRO			MATERIAL ET	-0	2		ECTED O	
a. QUANTITY	PER DAY	b. UNITS	OF MEASU	IRE	C.	OPERATION	ON, PRODUCT, (specify)	MATERIAL, ET	C.		(lis	t outfall nui	mbers)
N/A		N/A			N/A					N/A			
IV. IMPROVEM	ENTS												
A. Are you no treatment e	w required quipment or tions, admir	practices o	r any other e enforcement	nvironn	nental program	ns which m compliance	implementation hay affect the discrete schedule letter.  NO (go to Iter	scharges describers, stipulations,	oed in this app	lication? T	his ind	cludes, but	is not limited to
1. IDENTIFICA	TION OF C	ONDITION.	2. AF	FECTE	D OUTFALLS		0.00155	DECODIDE	05 000 150	-	4. FI	NAL COM	PLIANCE DATE
	EMENT, ET		a. NO.		URCE OF DISCH		3. BRIEF	DESCRIPTION	OF PROJECT			EQUIRED	b. PROJECTED
N/A			N/A	N/A			/A				N/A		N/A

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may affect your discharges) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

N/A

CONTINUED FROM PAGE 2

INTAKE AND EFFLUENT CHARACTERIS	TICS		
B, & C: See instructions before proceeding	ng – Complete one set of tables for each	outfall – Annotate the outfall number in the	e space provided.
Use the space below to list any of the pol	are included on separate sheets number llutants listed in Table 2c-3 of the instruct briefly describe the reasons you believe	ered v-1 through v-9.  Ictions, which you know or have reason to eve it to be present and report any analytica	believe is discharged or may be dischar
1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
ee Form 2F		3223	2:333.132
OTENTIAL DISCHARGES NOT COVER			
		you currently use or manufacture as an inte	rmediate or final product or byproduct?
YES (list all such pollutants below	ow ) <b>✓</b>	NO (go to Item VI-B)	

#### CONTINUED FROM THE FRONT

	4		
Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?			
YES (identify the test(s) and describe their purposes below)		NO (go to Section VIII)	
		NO (go to Section VIII)	
VIII. CONTRACT ANALYSIS INFORMATION	_		
Were any of the analyses reported in Item V	performed by a contract laboratory or consulting firm	?	
YES (list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)			
A. NAME	B. ADDRESS	C. TELEPHONE (area code & no.)	D. POLLUTANTS ANALYZED (list)
Eurofins Lancaster Laboratories Environmental	2425 New Holland Pike, Lancaster PA 17601	(717) 656-2300	Volatile, Acid, Base/Neutral, Pesticide
qualified personnel properly gather and evidirectly responsible for gathering the informare significant penalties for submitting false	nent and all attachments were prepared under my di aluate the information submitted. Based on my inq ation, the information submitted is, to the best of my information, including the possibility of fine and impri	uiry of the person or persons who in knowledge and belief, true, accurate sonment for knowing violations.	manage the system or those persons
I certify under penalty of law that this docum qualified personnel properly gather and evidirectly responsible for gathering the informare significant penalties for submitting false  A. NAME & OFFICIAL TITLE (type or print)	aluate the information submitted. Based on my inq ation, the information submitted is, to the best of my	uiry of the person or persons who is knowledge and belief, true, accurate sonment for knowing violations.  B. PHONE NO. (area code & no.)	manage the system or those persons
I certify under penalty of law that this docum qualified personnel properly gather and ev- directly responsible for gathering the inform- are significant penalties for submitting false	aluate the information submitted. Based on my inq ation, the information submitted is, to the best of my	uiry of the person or persons who in knowledge and belief, true, accurate sonment for knowing violations.	manage the system or those persons

EPA I.D. NUMBER (copy from Item 1 of Form 1)

DEE INOTINO TIONS.													
V. INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)													
PART A –You must pro	ovide the results	of at least one and	alysis for every pol	llutant in this table	e. Complete on	e table for each ou	tfall. See inst	ructions for add	itional details.				
				2. EFFLU	ENT				3. UN (specify if	-	(	INTAKE	
		IM DAILY VALUE	(if ava	30 DAY VALUE ailable)	c. LON	G TERM AVRG. V. (if available)	ALUE	d. NO. OF	a. CONCEN-		a. LONO TE AVERAGE V	ERM ALUE	b. NO. OF
1. POLLUTANT	(1) CONCENTRA	TION (2) MASS	(1) CONCENTRATIO	N (2) MASS	(1) CONCE	NTRATION	(2) MASS	ANALYSES	TRATION	b. MASS	CONCENTRATION	(2) MASS	ANALYSES
a. Biochemical Oxygen Demand (BOD)													
b. Chemical Oxygen Demand (COD)													
c. Total Organic Carbo (TOC)	n												
d. Total Suspended Solids (TSS)													
e. Ammonia (as N)													
f. Flow	VALUE		VALUE		VALUE						VALUE		
g. Temperature (winter)	VALUE		VALUE		VALUE				°C		VALUE		
h. Temperature (summer)	VALUE		VALUE		VALUE				°C		VALUE		
i. pH	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM					STANDARI	O UNITS			
	indirectly but e	expressly, in an eff	fluent limitations g	uideline, you mu	st provide the		one analysis	for that polluta	int. For other p	ollutants for v	umn 2a for any pollu which you mark colu		
2.	MARK "X"			3	. EFFLUENT	_				JNITS		ΓΑΚΕ (optiona	ıl)
1. POLLUTANT AND a.	b.	a. MAXIMUM D		b. MAXIMUM 30 (if availa		c. LONG TERM (if avail					a. LONG TERM VALU		
CAS NO. (if available) BELIE PRES		(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSE			(1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
a. Bromide (24959-67-9)													
b. Chlorine, Total Residual													
c. Color													
d. Fecal Coliform													
e. Fluoride (16984-48-8)													
f. Nitrate-Nitrite (as N)													

LIEW A-B CONT														
	2. MA	RK "X"			3.	EFFLUENT				4. UNI	ΓS	5. INT/	AKE (optiona	ıl)
1. POLLUTANT AND		b.	a. MAXIMUM DA	AILY VALUE	b. MAXIMUM 30 (if availa	DAY VALUE ble)	c. LONG TERM A (if availa					a. LONG TE AVERAGE V	ERM ALUE	
CAS NO. (if available)	a. BELIEVED PRESENT	b. BELIEVED ABSENT	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	(1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
g. Nitrogen, Total Organic (as N)														
h. Oil and Grease														
i. Phosphorus (as P), Total (7723-14-0)														
j. Radioactivity														
(1) Alpha, Total														
(2) Beta, Total														
(3) Radium, Total														
(4) Radium 226, Total														
k. Sulfate (as SO <sub>4</sub> ) (14808-79-8)														
I. Sulfide (as S)														
m. Sulfite (as SO <sub>3</sub> ) (14265-45-3)														
n. Surfactants														
o. Aluminum, Total (7429-90-5)														
p. Barium, Total (7440-39-3)														
q. Boron, Total (7440-42-8)														
r. Cobalt, Total (7440-48-4)														
s. Iron, Total (7439-89-6)														
t. Magnesium, Total (7439-95-4)														
u. Molybdenum, Total (7439-98-7)														
v. Manganese, Total (7439-96-5)														
w. Tin, Total (7440-31-5)														
x. Titanium, Total (7440-32-6)														

EPA I.D. NUMBER (copy from Item 1 of Form 1) OUTFALL NUMBER

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (all 7 pages) for each outfall. See instructions for additional details and requirements.

	additional details and requirements.														
	2	2. MARK "X"	,				FFLUENT				4. UN	ITS	5. INTA	AKE (optiona	(1)
1. POLLUTANT AND	a.	b.	C.	a. MAXIMUM DA	ILY VALUE	b. MAXIMUM 30 I (if availate	ble)	c. LONG TERM VALUE (if ava	ilable)	1 110 05	OONOFN		a. LONG T AVERAGE \		L NO 05
CAS NUMBER (if available)	TESTING REQUIRED	BELIEVED PRESENT	BELIEVED ABSENT	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	(1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
METALS, CYANIDE	E, AND TOT	AL PHENO	LS												
1M. Antimony, Total (7440-36-0)															
2M. Arsenic, Total (7440-38-2)															
3M. Beryllium, Total (7440-41-7)															
4M. Cadmium, Total (7440-43-9)															
5M. Chromium, Total (7440-47-3)															
6M. Copper, Total (7440-50-8)															
7M. Lead, Total (7439-92-1)															
8M. Mercury, Total (7439-97-6)															
9M. Nickel, Total (7440-02-0)															
10M. Selenium, Total (7782-49-2)															
11M. Silver, Total (7440-22-4)															
12M. Thallium, Total (7440-28-0)															
13M. Zinc, Total (7440-66-6)															
14M. Cyanide, Total (57-12-5)															
15M. Phenols, Total															
DIOXIN	DIOXIN														
2,3,7,8-Tetra- chlorodibenzo-P- Dioxin (1764-01-6)		_		DESCRIBE RESU	ILTS										

CONTINUED I IXO	OED FROM THE FROM		ı												
		2. MARK "X	,				FFLUENT				4. UN	IITS		KE (optional	()
1. POLLUTANT AND	a.	b.	C.	a. MAXIMUM DA	ILY VALUE	b. MAXIMUM 30 I (if availai		c. LONG TERM VALUE (if ava					a. LONG TI AVERAGE V	ERM ALUE	
CAS NUMBER (if available)	TESTING REQUIRED	b. BELIEVED PRESENT	BELIEVED ABSENT	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	(1) CONCENTRATION		b. NO. OF ANALYSES
GC/MS FRACTION	– VOLATIL	E COMPO	JNDS					•							
1V. Accrolein (107-02-8)															
2V. Acrylonitrile (107-13-1)															
3V. Benzene (71-43-2)															
4V. Bis ( <i>Chloro-methyl</i> ) Ether (542-88-1)				DELISTED	02-4-81	ANALYSIS	NOT	REQUIRED	FOR	THIS					
5V. Bromoform (75-25-2)															
6V. Carbon Tetrachloride (56-23-5)															
7V. Chlorobenzene (108-90-7)															
8V. Chlorodi- bromomethane (124-48-1)															
9V. Chloroethane (75-00-3)															
10V. 2-Chloro- ethylvinyl Ether (110-75-8)															
11V. Chloroform (67-66-3)															
12V. Dichloro- bromomethane (75-27-4)															
13V. Dichloro- difluoromethane (75-71-8)				DELISTED	01-8-81	ANALYSIS	NOT	REQUIRED	FOR	THIS					
14V. 1,1-Dichloro- ethane (75-34-3)															
15V. 1,2-Dichloro- ethane (107-06-2)															
16V. 1,1-Dichloro- ethylene (75-35-4)															
17V. 1,2-Dichloro- propane (78-87-5)															
18V. 1,3-Dichloro- propylene (542-75-6)															
19V. Ethylbenzepe (100-41-4)															
20V. Methyl Bromide (74-83-9)															
21V. Methyl Chloride (74-87-3)															

	2. MARK "X"				3. E	FFLUENT				4. UN	ITS	5. INTA	KE (optional	<i>l</i> )	
1. POLLUTANT AND						b. MAXIMUM 30 I		c. LONG TERM	AVRG.				a. LONG T	ERM	
CAS NUMBER	a. TESTING	b. BELIEVED	c. BELIEVED	a. MAXIMUM DA		(if availa	ble)	VALUE (if ava	ailable)	d. NO. OF	a. CONCEN-		AVERAGE V		b. NO. OF
(if available)		PRESENT	ABSENT	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	ANALYSES	TRATION	b. MASS	(1) CONCENTRATION	(2) MASS	ANALYSES
GC/MS FRACTION	I – VOLATIL	E COMPOU	JNDS (cont	inued)				Г	I	1	Τ				_
22V. Methylene Chloride (75-09-2)															
23V. 1,1,2,2- Tetrachloroethane (79-34-5)															
24V. Tetrachloro- ethylene (127-18-4)															
25V. Toluene (108-88-3)															
26V. 1,2-Trans- Dichloroethylene (156-60-5)															
27V. 1,1,1-Trichloro- ethane (71-55-6)															
28V. 1,1,2-Trichloro- ethane (79-00-5)															
29V Trichloro- ethylene (79-01-6)															
30V. Trichloro- fluoromethane (75-69-4)				DELISTED	01-8-81	ANALYSIS	NOT	REQUIRED	FOR	THIS					
31V. Vinyl Chloride (75-01-4)															
GC/MS FRACTION	I – ACID CC	MPOUNDS	5							•	•				
1A. 2-Chlorophenol (95-57-8)															
2A. 2,4-Dichloro- phenol (120-83-2)															
3A. 2,4-Dimethyl- phenol (105-67-9)															
4A. 4,6-Dinitro-O- Cresol (534-52-1)															
5A. 2,4-Dinitro- phenol (51-28-5)															
6A. 2-Nitrophenol (88-75-5)															
7A. 4-Nitrophenol (100-02-7)		/													
8A. P-Chloro-M- Cresol (59-50-7)															
9A. Pentachloro- phenol (87-86-5)															
10A. Phenol (108-95-2)															
11A. 2,4,6-Trichloro- phenol (88-05-2)															

CONTINUEDTRO		2. MARK "X'	19			3. E	FFLUENT				4. UN	ITS	5. INTA	KE (optiona	1)
1. POLLUTANT						b. MAXIMUM 30 [	DAY VALUE	c. LONG TERM	1 AVRG.				a. LONG TI	ERM	
AND CAS NUMBER	a.	b.	С.	a. MAXIMUM DA	LY VALUE	(if availal	ble)	VALUE (if ava	uilable)	4 NO OE	a. CONCEN-		AVERAGE V	ALUE	b. NO. OF
(if available)	TESTING REQUIRED	b. BELIEVED PRESENT	ABSENT	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	ANALYSES	TRATION	b. MASS	(1) CONCENTRATION	(2) MASS	ANALYSES
GC/MS FRACTION	– BASE/NE	EUTRAL CC	MPOUND:	S	(=)		(=)		(=)					/	
1B. Acenaphthene (83-32-9)															
2B. Acenaphtylene (208-96-8)															
3B. Anthracene (120-12-7)															
4B. Benzidine (92-87-5)															
5B. Benzo (a) Anthracene (56-55-3)															
6B. Benzo ( <i>a</i> ) Pyrene (50-32-8)															
7B. 3,4-Benzo- fluoranthene (205-99-2)															
8B. Benzo ( <i>ghi</i> ) Perylene (191-24-2)					•		•								
9B. Benzo (k) Fluoranthene (207-08-9)															
10B. Bis (2-Chloro- ethoxy) Methane (111-91-1)															
11B. Bis (2-Chloro- ethyl) Ether (111-44-4)															
12B. Bis (2- Chloroisopropyl) Ether (102-80-1)															
13B. Bis (2-Ethyl- hexyl) Phthalate (117-81-7)															
14B. 4-Bromophenyl Phenyl Ether (101-55-3)															
15B. Butyl Benzyl Phthalate (85-68-7)															
16B. 2-Chloro- naphthalene (91-58-7)															
17B. 4-Chloro- phenyl Phenyl Ether (7005-72-3)	/														
18B. Chrysene (218-01-9)															
19B. Dibenzo (a/l) Anthracene (53-70-3)															
20B. 1,2-Dichloro- benzene (95-50-1)															
21B. 1,3-Di-chloro- benzene (541-73-1)															

CONTINUED FROM		2. MARK "X'	,			3. E	FFLUENT				4. UN	ITS	5. INTA	KE (optiona	<i>l</i> )
1. POLLUTANT AND						b. MAXIMUM 30 I	DAY VALUE	c. LONG TERM	AVRG.				a. LONG T	ERM	
CAS NUMBER	a. TESTING	b. BELIEVED	c. BELIEVED	a. MAXIMUM DA	ILY VALUE	(if availa	ble)	VALUE (if ava	ailable)	d. NO. OF	a. CONCEN-		AVERAGE V		b. NO. OF
(if available)	REQUIRED	PRESENT	ABSENT	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	CONCENTRATION	(2) MASS	ANALYSES	TRATION	b. MASS	(1) CONCENTRATION	(2) MASS	ANALYSES
GC/MS FRACTION	N – BASE/N	EUTRAL CO	OMPOUND	S (continued)		<b>_</b>		T	ı	ı	Τ				
22B. 1,4-Dichloro- benzene (106-46-7)															
23B. 3,3-Dichloro- benzidine (91-94-1)															
24B. Diethyl Phthalate (84-66-2)															
25B. Dimethyl Phthalate (131 -11-3)															
26B. Di-N-Butyl Phthalate (84-74-2)										/					
27B. 2,4-Dinitro- toluene (121-14-2)															
28B. 2,6-Dinitro- toluene (606-20-2)															
29B. Di-N-Octyl Phthalate (117-84-0)															
30B. 1,2-Diphenyl- hydrazine (as Azo- benzene) (122-66-7)															
31B. Fluoranthene (206-44-0)															
32B. Fluorene (86-73-7)															
33B. Hexachloro- benzene (118-74-1)															
34B. Hexachloro- butadiene (87-68-3)															
35B. Hexachloro- cyclopentadiene (77-47-4)															
36B Hexachloro- ethane (67-72-1)															
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)															
38B. Isophorone (78-59-1)															
39B. Naphthalene (91-20-3)															
40B. Nitrobenzene (98-95-3)															
41B. N-Nitro- sodimethylamine (62-75-9)															
42B N-Nitrosodi- N-Propylamine (621-64-7)															

CONTINUED FROM THE FRONT

CONTINUED FROM		2. MARK "X	"			3. E	FFLUENT				4. UN	ITS	5. INTA	AKE (optional	<i>l</i> )
1. POLLUTANT AND						b. MAXIMUM 30 I	DAY VALUE	c. LONG TERM	1 AVRG.			-	a. LONG T	ERM	
CAS NUMBER (if available)	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAI (1) CONCENTRATION	(2) MASS	(if availated) (1) CONCENTRATION	(2) MASS	VALUE (if ava		d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	AVERAGE \( (1) \) CONCENTRATION		b. NO. OF ANALYSES
GC/MS FRACTION	I – BASE/NI	EUTRAL CO	DMPOUND:	S (continued)	(Z) WAGG	CONCENTIATION	(Z) WAGG	CONCENTIATION	(Z) WIAGO				CONCENTIATION	(Z) JAGO	
43B. N-Nitro- sodiphenylamine (86-30-6)															
44B. Phenanthrene (85-01-8)															
45B. Pyrene (129-00-0)															
46B. 1,2,4-Tri- chlorobenzene (120-82-1)															
GC/MS FRACTION	N – PESTIC	IDES							•						•
1P. Aldrin (309-00-2)															
2P. α-BHC (319-84-6)															
3P. β-BHC (319-85-7)															
4P. γ-BHC (58-89-9)															
5P. δ-BHC (319-86-8)															
6P. Chlordane (57-74-9)															
7P. 4,4'-DDT (50-29-3)															
8P. 4,4'-DDE (72-55-9)															
9P. 4,4'-DDD (72-54-8)															
10P. Dieldrin (60-57-1)															
11P. α-Enosulfan (115-29-7)															
12P. β-Endosulfan (115-29-7)															
13P. Endosulfan Sulfate (1031-07-8)															
14P. Endrin (72-20-8)															
15P. Endrin Aldehyde (7421-93-4)															
16P. Heptachlor (76-44-8)															

EPA I.D. NUMBER (copy from Item 1 of Form 1)	OUTFALL NUMBER

CONTINUED FROM PAGE V-8

CONTINUED FINOM FACE V O															
	2	2. MARK "X	"			3. E	FFLUENT	<u> </u>			4. UN	ITS	5. INTAK	E (optional)	)
1. POLLUTANT AND	a.	b.	C.	a. MAXIMUM DA	ILY VALUE	b. MAXIMUM 30 l		c. LONG TERM VALUE (if ava					a. LONG TEF AVERAGE VA	LUE	
CAS NUMBER (if available)	TESTING REQUIRED		BELIEVED ABSENT	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	(1) CONCENTRATION		b. NO. OF ANALYSES
GC/MS FRACTION	I – PESTICI	IDES (contin	ued)												
17P. Heptachlor Epoxide (1024-57-3)															
18P. PCB-1242 (53469-21-9)															
19P. PCB-1254 (11097-69-1)															
20P. PCB-1221 (11104-28-2)															
21P. PCB-1232 (11141-16-5)															
22P. PCB-1248 (12672-29-6)															
23P. PCB-1260 (11096-82-5)															
24P. PCB-1016 (12674-11-2)															
25P. Toxaphene (8001-35-2)															
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#### **CODES FOR TREATMENT UNITS**

## PHYSICAL TREATMENT PROCESSES

1–A Ammonia Stripping	1–M Grit Removal
1–B Dialysis	1–N Microstraining
1–C Diatomaceous Earth Filtration	1–O Mixing
1–D Distillation	1–P Moving Bed Filters
1–E Electrodialysis	1–Q Multimedia Filtration
1–F Evaporation	1–R Rapid Sand Filtration
1–G Flocculation	1–S Reverse Osmosis ( <i>Hyperfiltration</i> )
1–H Flotation	1–T Screening
1–I Foam Fractionation	1–U Sedimentation (Settling)
1–J Freezing	1–V Slow Sand Filtration
1–K Gas–Phase Separation	1–W Solvent Extraction
1–L Grinding (Comminutors)	1–X Sorption

## CHEMICAL TREATMENT PROCESSES

2–A Carbon Adsorption	2–G Disinfection (Ozone)
2–B Chemical Oxidation	2–H Disinfection (Other)
2–C Chemical Precipitation	2–I Electrochemical Treatment
2–D Coagulation	2–J Ion Exchange
2–E Dechlorination	2–K Neutralization
2–F Disinfection (Chlorine)	2–L Reduction

## BIOLOGICAL TREATMENT PROCESSES

3–A Activated Sludge	3–E Pre-Aeration
3–B Aerated Lagoons	3–F Spray Irrigation/Land Application
3–C Anaerobic Treatment	3–G Stabilization Ponds
3–D Nitrification–Denitrification	3–H Trickling Filtration

## OTHER PROCESSES

4–A	Discharge to Surface Water	4–C	Reuse/Recycle of Treated Effluent
4–B	Ocean Discharge Through Outfall	4-D	Underground Injection

## SLUDGE TREATMENT AND DISPOSAL PROCESSES

5–A	Aerobic Digestion	5–M	Heat Drying
5–B	Anaerobic Digestion	5–N	Heat Treatment
5–C	Belt Filtration	5–0	Incineration
5–D	Centrifugation	5–P	Land Application
5–E	Chemical Conditioning	5–Q	Landfill
5–F	Chlorine Treatment	5–R	Pressure Filtration
5–G	Composting	5–S	Pyrolysis
5–H	Drying Beds	5–T	Sludge Lagoons
5–I	Elutriation	5–U	Vacuum Filtration
5–J	Flotation Thickening	5–V	Vibration
5–K	Freezing	5–W	Wet Oxidation
5–L	Gravity Thickening		

#### TESTING REQUIREMENTS FOR ORGANIC TOXIC POLLUTANTS INDUSTRY CATEGORY\*

INDUSTRY CATEGORY		GC/MS	S FRACTION <sup>1</sup>	
INDOCTOR OF TEOCOR	Volatile	Acid	Base/Neutral	Pesticide
Adhesives and sealants	X	X	X	_
Aluminum forming	X	X	Χ	_
Auto and other laundries	X	X	Χ	X
Battery manufacturing		_	Χ	_
Coal mining	X	X	Χ	X
Coil coating		X	Χ	_
Copper forming		X	Χ	_
Electric and electronic compounds		X	Χ	X
Electroplating	X	X	Χ	_
Explosives manufacturing	–	X	Χ	_
Foundries		Χ	X	_
Gum and wood chemicals	X	X	Χ	X
Inorganic chemicals manufacturing	X	X	X	_
Iron and steel manufacturing	X	X	Χ	_
Leather tanning and finishing	X	X	Χ	X
Mechanical products manufacturing	X	X	Χ	_
Nonferrous metals manufacturing	X	X	X	X
Ore mining		X	Χ	X
Organic chemicals manufacturing	X	X	Χ	X
Paint and ink formulation		X	Χ	X
Pesticides	X	X	Χ	X
Petroleum refining	X	X	X	X
Pharmaceutical preparations	X	X	Χ	_
Photographic equipment and supplies	X	X	Χ	X
Plastic and synthetic materials manufacturing		Χ	Χ	X
Plastic processing		_	_	_
Porcelain enameling		_	X	X
Printing and publishing		X	Х	X
Pulp and paperboard mills		X	X	X
Rubber processing		X	X	_
Soap and detergent manufacturing		X	X	_
Steam electric power plants		X	X	_
Textile mills		X	X	X
Timber products processing		X	X	X

<sup>\*</sup>See note at conclusion of 40 CFR Part 122, Appendix D (1983) for explanation of effect of suspensions on testing requirements for primary industry categories.

¹The pollutants in each fraction are listed in Item V-C.

X = Testing required.

- = Testing not required.

# TOXIC POLLUTANTS AND HAZARDOUS SUBSTANCES REQUIRED TO BE IDENTIFIED BY APPLICANTS IF EXPECTED TO BE PRESENT

TOXIC POLLUTANT HAZARDOUS SUBSTANCES HAZARDOUS SUBSTANCES

Asbestos Dichlorvos Naled

Diethyl amine Napthenic acid
HAZARDOUS SUBSTANCES Dimethyl amine Nitrotoluene
Dintrobenzene Parathion
Acetaldehyde Diquat Phenolsulfonate

Allyl alcohol Disulfoton Phosgene Allyl chloride Diuron Propargite Amyl acetate Epichlorohydrin Propylene oxide Pyrethrins Aniline Ethion Benzonitrile Ethylene diamine Quinoline Benzyl chloride Ethylene dibromide Resorcinol Butyl acetate Formaldehyde Strontium Butylamine Furfural Strychnine Captan Guthion Styrene

Carbaryl Isoprene 2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Carbofuran Isopropanolamine TDE (Tetrachlorodiphenyl ethane)

Carbon disulfide Kelthane 2,4,5-TP [2-(2,4,5-Trichlorophenoxy) propanoic acid]

Zirconium

Chlorpyrifos Trichlorofon Kepone Coumaphos Malathion Triethanolamine Triethylamine Cresol Mercaptodimethur Crotonaldehyde . Methoxychlor Trimethylamine Cyclohexane Methyl mercaptan Uranium 2,4-D (2,4-Dichlorophenoxyacetic acid) Methyl methacrylate Vanadium Methyl parathion Diazinon Vinyl acetate Xylene Dicamba Mevinphos Dichlobenil Mexacarbate Xylenol

Dichlone Monoethyl amine 2,2-Dichloropropionic acid Monomethyl amine

#### **HAZARDOUS SUBSTANCES**

Acetaldehyde	74. Carbaryl	145. Formaldehyde
Acetic acid	75. Carbofuran	146. Formic acid
3. Acetic anhydride	76. Carbon disulfide	147. Fumaric acid
Acetone cyanohydrin	77. Carbon tetrachloride	148. Furfural
5. Acetyl bromide	78. Chlordane	149. Guthion
6. Acetyl chloride	79. Chlorine	150. Heptachlor
7. Acrolein	80. Chlorobenzene	151. Hexachlorocyclopentadiene
Acrylonitrile     Adipic acid	81. Chloroform 82. Chloropyrifos	152. Hydrochloric acid 153. Hydrofluoric acid
10. Aldrin	83. Chlorosulfonic acid	154. Hydrogen cyanide
11. Allyl alcohol	84. Chromic acetate	155. Hydrogen sulfide
12. Allyl chloride	85. Chromic acid	156. Isoprene
13. Aluminum sulfate	86. Chromic sulfate	157. Isopropanolamine
14. Ammonia	87. Chromous chloride	dodecylbenzenesulfonate
15. Ammonium acetate	88. Cobaltous bromide	158. Kelthane
16. Ammonium benzoate	89. Cobaltous formate	159. Kepone
17. Ammonium bicarbonate	90. Cobaltous sulfamate 91. Coumaphos	160. Lead accetate
18. Ammonium bichromate 19. Ammonium bifluoride	92. Cresol	161. Lead arsenate 162. Lead chloride
20. Ammonium bisulfite	93. Crotonaldehyde	163. Lead fluoborate
21. Ammonium carbamate	94. Cupric acetate	164. Lead flourite
22. Ammonium carbonate	95. Cupric acetoarsenite	165. Lead iodide
23. Ammonium chloride	96. Cupric chloride	166. Lead nitrate
24. Ammonium chromate	97. Cupric nitrate	167. Lead stearate
25. Ammonium citrate	98. Cupric oxalate	168. Lead sulfate
26. Ammonium fluoroborate	99. Cupric sulfate	169. Lead sulfide
27. Ammonium fluoride	100. Cupric sulfate ammoniated	170. Lead thiocyanate
28. Ammonium hydroxide	101. Cupric tartrate	171. Lindane 172. Lithium chromate
29. Ammonium oxalate     30. Ammonium silicofluoride	102. Cyanogen chloride 103. Cyclohexane	172. Lithium chromate 173. Malathion
31. Ammonium sulfamate	104. 2,4-D acid (2,4- Dichlorophenoxyacetic	174. Maleic acid
32. Ammonium sulfide	acid)	175. Maleic anhydride
33. Ammonium sulfite	105. 2,4-D esters (2,4- Dichlorophenoxyacetic	176. Mercaptodimethur
34. Ammonium tartrate	acid esters)	177. Mercuric cyanide
35. Ammonium thiocyanate	106. DDT	178. Mercuric nitrate
36. Ammonium thiosulfate	107. Diazinon	179. Mercuric sulfate
37. Amyl acetate	108. Dicamba	180. Mercuric thiocyanate
38. Aniline	109. Dichlobenil	181. Mercurous nitrate
<ul><li>39. Antimony pentachloricle</li><li>40. Antimony potassium tartrate</li></ul>	110. Dichlone 111. Dichlorobenzene	182. Methoxychlor 183. Methyl mercaptan
41. Antimony tribromide	112. Dichloropropane	184. Methyl methacrylate
42. Antimony trichloride	113. Dichloropropene	185. Methyl parathion
43. Antimony trifluoride	114. Dichloropropene-dichloproropane mix	186. Mevinphos
44. Antimony trioxide	115. 2,2-Dichloropropionic acid	187. Mexacarbate
45. Arsenic disulfide	116. Dichlorvos	188. Monoethylamine
46. Arsenic pentoxide	117. Dieldrin	189. Monomethylamine
47. Arsenic trichloride	118. Diethylamine	190. Naled
48. Arsenic trioxide	119. Dimethylamine	191. Naphthalene
49. Arsenic trisulfide	120. Dinitrobenzene 121. Dinitrophenol	192. Naphthenic acid 193. Nickel ammonium sulfate
50. Barium cyanide 51. Benzene	122. Dinitrophenoi 122. Dinitrotoluene	193. Nickel animonium suifate
52. Benzoic acid	123. Diquat	195. Nickel hydroxide
53. Benzonitrile	124. Disulfoton	196. Nickel nitrate
54. Benzoyl chloride	125. Diuron	197. Nickel sulfate
55. Benzyl chloride	126. Dodecylbenzesulfonic acid	198. Nitric acid
56. Beryllium chloride	127. Endosulfan	199. Nitrobenzene
57. Beryllium fluoride	128. Endrin	200. Nitrogen dioxide
58. Beryllium nitrate	129. Epichlorohydrin	201. Nitrophenol
59. Butylacetate	130. Ethion	202. Nitrotoluene
60. n-Butylphthalate 61. Butylamine	131. Ethylbenzene 132. Ethylenediamine	203. Paraformaldehyde 204. Parathion
62. Butyric acid	133. Ethylene dibromide	205. Pentachlorophenol
63. Cadmium acetate	134. Ethylene dichloride	206. Phenol
64. Cadmium bromide	135. Ethylene diaminetetracetic acid (EDTA)	207. Phosgene
65. Cadmium chloride	136. Ferric ammonium citrate	208. Phosphoric acid
66. Calcium arsenate	137. Ferric ammonium oxalate	209. Phosphorus
67. Calcium arsenite	138. Ferric chloride	210. Phosphorus oxychloride
69. Calcium carbide	139. Ferric fluoride	211. Phosphorus pentasulfide
69. Calcium chromate	140. Ferric nitrate	212. Phosphorus trichloride
70. Calcium cyanide	141. Ferric sulfate 142. Ferrous ammonium sulfate	213. Polychlorinated biphenyls (PCB)
71. Calcium dodecylbenzenesulfonate 72. Calcium hypochlorite		214. Potassium arsenate
	143. Ferrous chloride	215. Potassium arsenite

216. Potassium bichromate

73. Captan

#### **HAZARDOUS SUBSTANCES**

221. Propargite 222. Propionic acid 223. Propionic anhydride 224. Propylene oxide 225. Pyrethrins 226. Quinoline

227. Resorcinol 228. Selenium oxide 229. Silver nitrate

230. Sodium 231. Sodium arsenate

232. Sodium arsenite 233. Sodium bichromate 234. Sodium bifluoride 235. Sodium bisulfite

236. Sodium chromate 237. Sodium cyanide

238. Sodium dodecylbenzenesulfonate

239. Sodium fluoride 240. Sodium hydrosulfide 241. Sodium hydroxide 242. Sodium hypochlorite 243. Sodium methylate 244. Sodium nitrite 245. Sodium phosphate (dibasic)

246. Sodium phosphate (tribasic)

247. Sodium selenite 248. Strontium chromate 249. Strychnine

250. Styrene 251. Sulfuric acid 252. Sulfur monochloride 253. 2,4,5-T acid (2,4,5-

Trichlorophenoxyacetic acid) 254. 2,4,5-T amines (2,4,5-Trichlorophenoxy acetic acid amines)

255. 2,4,5-T esters (2,4,5 Trichlorophenoxy acetic acid esters)

256. 2,4,5-T salts (2,4,5-Trichlorophenoxy acetic acid salts)

257. 2,4,5-TP acid (2,4,5-Trichlorophenoxy propanoic acid)

258. 2,4,5-TP acid esters (2,4,5-Trichlorophenoxy propanoic acid esters)

259. TDE (Tetrachlorodiphenyl ethane) 260. Tetraethyl lead

261. Tetraethyl pyrophosphate

262. Thallium sulfate 263. Toluene 264. Toxaphene 265. Trichlorofon 266. Trichloroethylene 267. Trichlorophenol 268. Triethanolamine dodecylbenzenesulfonate

269. Triethylamine

270. Trimethylamine 271. Uranyl acetate 272. Uranyl nitrate 273. Vanadium penoxide 274. Vanadyl sulfate 275. Vinyl acetate

276. Vinylidene chloride 277. Xylene

278. Xylenol 279. Zinc acetate

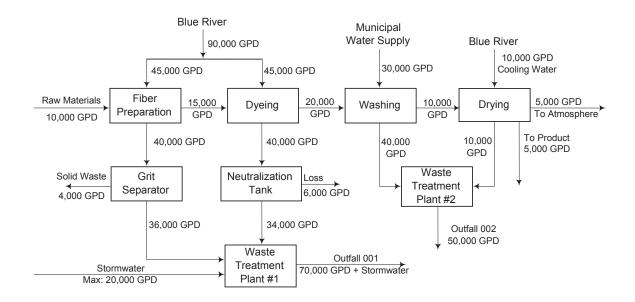
280. Zinc ammonium chloride

281. Zinc borate 282. Zinc bromide 283. Zinc carbonate 284. Zinc chloride 285. Zinc cyanide 286. Zinc fluoride 287. Zinc formate 288. Zinc hydrosulfite 289. Zinc nitrate

290. Zinc phenolsulfonate 291. Zinc phosphide 292. Zinc silicofluoride 293. Zinc sulfate 294. Zirconium nitrate

295. Zirconium potassium flouride

296. Zirconium sulfate 297. Zirconium tetrachloride



Schematic of Water Flow Brown Mills, Inc. City, County, State



## **EPA FORM 2F**

Form Approved. OMB No. 2040-0086 Approval expires 5-31-92

2F SEPA

U.S. Environmental Protection Agency Washington, DC 20460

## Application for Permit to Discharge Storm Water Discharges Associated with Industrial Activity

#### **Paperwork Reduction Act Notice**

Public reporting burden for this application is estimated to average 28.6 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of this collection of information, or suggestions for improving this form, including suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

#### . Outfall Location

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. Outfall Number (list)		B. Latitude			C. Longitude		D. Receiving Water (name)
001/901	38	51	03	77	16	30	Unnamed tributary to Daniels Run
101	38	50	51	77	16	45	Storm Water Impoundment Basin
102	38	51	01	77	16	29	Storm Water Impoundment Basin
103	38	51	0.0	77	16	34	Storm Water Impoundment Basin
106	38	51	01	77	16	35	Storm Water Impoundment Basin

#### II. Improvements

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

Identification of Conditions,     Agreements, Etc.		2. Affected Outfalls		4. Final Compliance Date	
Agreements, Etc.	number	source of discharge	Brief Description of Project	a. req.	b. proj.
N/A	N/A	N/A	N/A		

B: You may attach additional sheets describing any additional water pollution (or other environmental projects which may affect your discharges) you now have under way or which you plan. Indicate whether each program is now under way or planned, and indicate your actual or planned schedules for construction.

#### III. Site Drainage Map

Attach a site map showing topography (or indicating the outline of drainage areas served by the outfalls(s) covered in the application if a topographic map is unavailable) depicting the facility including: each of its intake and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within the drainage area of each storm water outfall, each known past or present areas used for outdoor storage of disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied; each of its hazardous waste treatment, storage or disposal units (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground; springs, and other surface water bodies which received storm water discharges from the facility.

See Figures 7-13.

Continued from the Front

IV. Narra	tive Description of Pollutant	Sources						
	ch outfall, provide an estimate of the area (inc d by the outfall.	lude units) of imperious surface	es (including p	aved areas and building roofs) drained to the outfall, and	an estimate of the total surface area			
Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)	Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)			
901	53.2 acres	106.4 acres	N/A	N/A	N/A			
to storm	B. Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored or disposed in a manner to allow exposure to storm water; method of treatment, storage, or disposal; past and present materials management practices employed to minimize contact by these materials with storm water runoff; materials loading and access areas, and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied.							
See narra	tive included in Appendix B.	Also see Table 2.						
descri		receives, including the sch		nonstructural control measures to reduce pollutar ope of maintenance for control and treatment mea				
Outfall Number		Ti	reatment		List Codes from Table 2F-1			
V. Nonst	ormwater Discharges							
				n tested or evaluated for the presence of nonstor ying Form 2C or From 2E application for the outfal				
	Official Title (type or print)  Source (President)	ignature			Date Signed			
Non-storm	B. Provide a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test.  Non-stormwater discharges have been identified and evaluated in risk assessment and site characterization reports previously prepared for the facility. These reports were submitted to the DEQ prior to 1994.							
VI. Signif	ficant Leaks or Spills							
	existing information regarding the hist nate date and location of the spill or leak			xic or hazardous pollutants at the facility in the released.	last three years, including the			
See Table	4.							

## **Continued from Page 2**

VII. Discharge Information			
	ceeding. Complete one set of tables for each outfall. A included on separate sheets numbers VII-1 and VII-2		pace provided.
E. Potential discharges not covered by a currently use or manufacture as an inte	nalysis – is any toxic pollutant listed in table 2F-2, 2 rmediate or final product or byproduct?	PF-3, or 2F-4, a substance or a c	component of a substance which you
✓ Yes (list all such pollutants b		No (go to Section IX)	
See parts A, B, C, and D on next	gago.		
VIII Piological Taxiaity Testing D	loto		
relation to your discharge within the last 3 y	pelieve that any biological test for acute or chronic toxi years?		r discharges or on a receiving water in
Yes (list all such pollutants be See Appendix C.	elow)	No (go to Section IX)	
✓ Yes (list the name, address, a	VII performed by a contract laboratory or consulting fin and telephone number of, and pollutants	m?	
analyzed by, each such l	,	O Assa Osala A Flores No.	D. Pollutants Analyzed
A. Name	B. Address	C. Area Code & Phone No.	·
Air, Water, and Soil Laboratories, Inc.	2109A North Hamilton Street, Richmond, VA 23230	(804) 358-8295	G 3
Coastal Bioanalysts, Inc.			See Appendix C.
Coastal Bloamarysts, Inc.	6400 Enterprise Court, Gloucester, VA 23061	(804) 694-8285	See Appendix C.
Eurofins Lancaster Laboratories Environmental		(804) 694-8285 (717) 656-2300	See Appendix C.
Eurofins Lancaster Laboratories	23061 2425 New Holland Pike, Lancaster, PA		See Appendix C.
Eurofins Lancaster Laboratories Environmental	23061  2425 New Holland Pike, Lancaster, PA 17601  770 Pilot House Drive, Newport News, VA	(717) 656-2300	See Appendix C.
Eurofins Lancaster Laboratories Environmental James R. Reed & Associates	23061  2425 New Holland Pike, Lancaster, PA 17601  770 Pilot House Drive, Newport News, VA 23606  2960 Foster Creighton Drive, Nashville,	(717) 656-2300 (757) 873-4703	See Appendix C.
Eurofins Lancaster Laboratories Environmental  James R. Reed & Associates  TestAmerica Laboratories, Inc.  X. Certification  I certify under penalty of law that this document that qualified personnel properly gather and directly responsible for gathering the information of the second content of the second c	23061  2425 New Holland Pike, Lancaster, PA 17601  770 Pilot House Drive, Newport News, VA 23606  2960 Foster Creighton Drive, Nashville,	(717) 656-2300 (757) 873-4703 (615) 726-0177  irrection or supervision in accorda juiry of the person or persons who y knowledge and belief, true, acc	nce with a system designed to assure or manage the system or those persons curate, and complete. I am aware that
Eurofins Lancaster Laboratories Environmental  James R. Reed & Associates  TestAmerica Laboratories, Inc.  X. Certification  I certify under penalty of law that this document that qualified personnel properly gather and directly responsible for gathering the information of the second content of the second c	23061  2425 New Holland Pike, Lancaster, PA 17601  770 Pilot House Drive, Newport News, VA 23606  2960 Foster Creighton Drive, Nashville, TN 37204  ument and all attachments were prepared under my of devaluate the information submitted. Based on my incommation, the information submitted is, to the best of my gralse information, including the possibility of fine and	(717) 656-2300 (757) 873-4703 (615) 726-0177  irrection or supervision in accorda juiry of the person or persons who y knowledge and belief, true, acc	nce with a system designed to assure or manage the system or those persons curate, and complete. I am aware that
Eurofins Lancaster Laboratories Environmental  James R. Reed & Associates  TestAmerica Laboratories, Inc.  X. Certification  I certify under penalty of law that this doct that qualified personnel properly gather and directly responsible for gathering the infonthere are significant penalties for submitting	23061  2425 New Holland Pike, Lancaster, PA 17601  770 Pilot House Drive, Newport News, VA 23606  2960 Foster Creighton Drive, Nashville, TN 37204  ument and all attachments were prepared under my of devaluate the information submitted. Based on my inc mation, the information submitted is, to the best of my false information, including the possibility of fine and	(717) 656-2300 (757) 873-4703 (615) 726-0177  irrection or supervision in accordativity of the person or persons who by knowledge and belief, true, accomprisonment for knowing violation	nce with a system designed to assure or manage the system or those persons curate, and complete. I am aware that

#### VII. Discharge information (Continued from page 3 of Form 2F)

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

		um Values ude units)	Average Values (include units)		Number	
Pollutant and CAS Number (if available)	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	of Storm Events Sampled	Sources of Pollutants
Oil and Grease	<10 mg/L	N/A	NA	NA	NA	NA
Biological Oxygen Demand (BOD5)	6.9 mg/L	NA	NA	NA	NA	NA
Chemical Oxygen Demand (COD)	22.8 mg/L	NA	NA	NA	NA	NA
Total Suspended Solids (TSS)	11.5 mg/L	NA	NA	NA	1	NA
Total Nitrogen	1.1 mg/L	NA	NA	NA	NA	NA
Total Phosphorus	0.07 mg/L	NA	NA	NA	NA	NA
рН	Minimum <sub>NA</sub>	Maximum <sub>NA</sub>	Minimum 6.44	Maximum <sub>NA</sub>	1	NA

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

	Maximum Values Average Values (include units) (include units)			Average Values (include units)		
Pollutant and CAS Number (if available)	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	of Storm Events Sampled	Sources of Pollutants
See Tables 5	and 6.			·		

Continued fro	m the Front							
Part C - Lis	t each pollutant show	vn in Table 2F-2, 2F-3, e one table for each ou	and 2F-4 that yo	ou know or have reason to	belie	ve is preser	nt. See the instruc	ctions for additional details and
rec	· · · ·	e one table for each out	I	erage Values				
		de units)		clude units)	N	Number		
Pollutant	Grab Sample		Grab Sample		1	of Storm		
and CAS Number	Taken During First 20	Flow-Weighted	Taken During First 20	Flow-Weighted		Events		
(if available)	Minutes	Composite	Minutes	Composite	S	ampled	So	urces of Pollutants
See Tables	5 and 6.							
Part D - Pr	ovide data for the sto	rm event(s) which resu	ilted in the maxim	um values for the flow wei	iahted	composite	samnle	
Ture Tr		min ovoni(o) willon root	med in the maxim	4.	gritou	Composito	5.	
1.	2.	3.		Number of hours between			flow rate during	6.
Date of Storm	Duration of Storm Event	Total rair during storm		beginning of storm meas and end of previous	sured		in event ns/minute or	Total flow from rain event
Event	(in minutes)	(in inche		measurable rain ever			cify units)	(gallons or specify units)
See Append	ix D.							See Attachment 3.1.
L'E	·							
7. Provide a	description of the me	thod of flow measurem	nent or estimate.					
								ot was used to estimate
the maximum	I IIOW rate. To	taı flow was esti	mated by mult	iplying the maximum	I ILOV	w rate by	the storm du	ration.

## Table 2F-1 Codes for Treatment Units

## **Physical Treatment Processes**

1-A 1-B 1-C 1-D 1-E 1-F 1-G 1-H 1-1 1-J 1-K 1-L	Ammonia Stripping Dialysis Diatomaceous Earth Filtration Distillation Electrodialysis Evaporation Flocculation Flotation Foam Fractionation Freezing Gas-Phase Separation Grinding (Comminutors)	1-M 1-N 1-0 1-P 1-Q 1-R 1-S 1-T 1-U 1-V 1-W 1-X	Grit Removal Microstraining Mixing Moving Bed Filters Multimedia Filtration Rapid Sand Filtration Reverse Osmosis (Hyperfiltration) Screening Sedimentation (Setting) Slow Sand Filtration Solvent Extraction Sorption
	Chemical Treatment I	Processes	5
2-A 2-B 2-C 2-D 2-E 2-F	Carbon Adsorption Chemical Oxidation Chemical Precipitation Coagulation Dechlorination Disinfection (Chlorine)	2-G 2-H 2-I 2-J 2-K 2-L	Disinfection (Ozone) Disinfection (Other) Electrochemical Treatment Ion Exchange Neutralization Reduction
	Biological Treatment	Processes	S
3-A 3-B 3-C 3-D	Activated Sludge Aerated Lagoons Anaerobic Treatment Nitrification-Denitrification	3-E 3-F 3-G 3-H	Pre-Aeration Spray Irrigation/Land Application Stabilization Ponds Trickling Filtration
	Other Process	es	
4-A 4-B	Discharge to Surface Water Ocean Discharge Through Outfall	4-C 4-D	Reuse/Recycle of Treated Effluent Underground Injection
	Sludge Treatment and Disp	osal Prod	cesses
5-A 5-B 5-C 5-E 5-F 5-H 5-J 5-K 5-L	Aerobic Digestion Anaerobic Digestion Belt Filtration Centrifugation Chemical Conditioning Chlorine Treatment Composting Drying Beds Elutriation Flotation Thickening Freezing Gravity Thickening	5-M 5-N 5-0 5-P 5-0 5-R 5-S 5-T 5-U 5-V 5-W	Heat Drying Heat Treatment Incineration Land Application Landfill Pressure Filtration Pyrolysis Sludge Lagoons Vacuum Filtration Vibration Wet Oxidation

#### Table 2F-2

## **Conventional and Nonconventional Pollutants**

Bromide

Chlorine, Total Residual

Color

Fecal Coliform

Fluoride

Nitrate-Nitrite

Nitrogen, Total Organic

Oil and Grease Phosphorus, Total

Radioactivity

Sulfate

Sulfite

Surfactants

Aluminum, Total Barium, Total Boron, Total Cobalt Total

Iron, Total

Magnesium, Total

Molybdenum, Total Manganese, Total Tin, Total

Titanium, Total

## Table 2F-3

## **Toxic Pollutants**

## **Toxic Pollutants and Total Phenol**

Antimony, Total	Copper, Total	Silver, Total
Arsenic, Total	Lead, Total	Thallium, Total
Beryllium, Total	Mercury, Total	Zinc, Total
Cadmium, Total	Nickel, Total	Cyanide, Total
Chromium, Total	Selenium, Total	Phenols, Total

## **GC/MS Fraction Volatiles Compounds**

Acrolein	Dichlorobromomethane	1,1,2,2,-Tetrachloroethane
Acrylonitrile	1,1-Dichloroethane	Tetrachloroethylene
Benzene	1,2-Dichloroethane	Toluene
Bromoform	1,1-Dichloroethylene	1,2-Trans-Dichloroethylene
Carbon Tetrachloride	1,2-Dichloropropane	1,1,1-Trichloroethane
Chlorobenzene	1.3-Dichloropropylene	1,1,2-Trichloroethane
Chlorodibromomethane	Ethylbenzene	Trichloroethylene
Chloroethane	Methyl Bromide	Vinyl Chloride
2-Chloroethylvinyl Ether	Methyl Chloride	
Chloroform	Methylene Chloride	

## **Acid Compounds**

2-Chlorophenol	2,4-Dinitrophenol	Pentachlorophenol
2,4-Dichlorophenol	2-Nitrophenol	Phenol
2,4-Dimethylphenol	4-Nitrophenol	2,4,6-Trichlorophenol
4,6-Dinitro-O-Cresol	p-Chloro-M-Cresol	2-methyl-4,6 dinitrophenol

## Base/Neutral

Acenaphthene	2-Chloronaphthalene	Fluroranthene
Acenaphthylene	4-Chlorophenyl Phenyl Ether	Fluorene
Anthracene	Chrysene	Hexachlorobenzene
Benzidine	Dibenzo(a,h)anthracene	Hexachlorobutadiene
Benzo(a)anthracene	1,2-Dichlorobenzene	Hexachloroethane
Benzo(a)pyrene	1,3-Dichlorobenzene	Indeno(1,2,3-cd)pyrene
3,4-Benzofluoranthene	1,4-Dichlorobenzene	Isophorone
Benzo(ghi)perylene	3,3'-Dichlorobenzidine	Napthalene
Benzo(k)fluoranthene	Diethyl Phthalate	Nitrobenzene
Bis(2-chloroethoxy)methane	Dimethyl Phthalate	N-Nitrosodimethylamine
Bis(2-chloroethyl)ether	Di-N-Butyl Phthalate	N-Nitrosodi-N-Propylamine
Bis(2-chloroisopropyl)ether	2,4-Dinitrotoluene	N-Nitrosodiphenylamine
Bis(2-ethylyhexyl)phthalate	2,6-Dinitrotoluene	Phenanthrene
4-Bromophenyl Phenyl Ether	Di-N-Octyphthalate	Pyrene
Butylbenzyl Phthalate	1,2-Diphenylhydrazine (as Azobenzene)	1,2,4-Trichlorobenzene

#### **Pesticides**

Aldrin	Dieldrin	PCB-1254
Alpha-BHC	Alpha-Endosulfan	PCB-1221
Beta-BHC	Beta-Endosulfan	PCB-1232
Gamma-BHC	Endosulfan Sulfate	PCB-1248
Delta-BHC	Endrin	PGB-1260
Chlordane	Endrin Aldehyde	PCB-1016
4,4'-DDT	Heptachlor	Toxaphene
4,4'-DDE	Heptachlor Epoxide	
4,4'-DDD	PCB-1242	

#### Table 2F-4

#### **Hazardous Substances**

#### **Toxic Pollutant**

#### Asbestos

#### **Hazardous Substances**

Acetaldehyde Dinitrobenzene Napthenic acid Allyl alcohol Diquat Nitrotoluene Allyl chloride Disulfoton Parathion Amyl acetate Diuron Phenolsulfonate Aniline . Epichlorohydrin Phosgene Benzonitrile Ethion Propargite Benzyl chloride Ethylene diamine Propylene oxide Butyl acetate Ethylene dibromide Pyrethrins Formaldehyde Butylamine Quinoline Carbaryl Furfural Resorcinol Carbofuran Guthion Stronthium Carbon disulfide Isoprene Strychnine Isopropanolamine Styrene Chlorpyrifos

Coumaphos Kelthane 2,4,5-T (2,4,5-Trichlorophenoxyacetic

Kepone TDE (Tetrachlorodiphenyl ethane) Cresol Crotonaldehyde Malathion 2,4,5-TP [2-(2,4,5-Trichlorophenoxy)

propanoic acid]

Cyclohexane Mercaptodimethur Trichlorofan

2,4-D (2,4-Dichlorophenoxyacetic Methoxychlor Triethylamine acid)

Diazinon Methyl mercaptan Trimethylamine Dicamba Methyl methacrylate Uranium Dichlobenil Methyl parathion Vanadium Mevinphos Dichlone Vinyl acetate 2,2-Dichloropropionic acid Mexacarbate Xylene

Dichlorvos Monoethyl amine Xylenol Diethyl amine Monomethyl amine Zirconium

Dimethyl amine Naled



## APPENDIX A

Flow Calculations

TIME	TINT	Q(1)	O(2)	0(3)	Oth	()(6)	000	TOTO		YR STORM		VOLUME	VOLUME
(hrs)	(hrs)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	TOT Q (cfs)	Q AVG	VOI.UME	AM(1)	AM(2)	AM(3)
` ′	()	()	(-1-)	(0.0)	(C13)	(613)	(cis)	(613)	(cfs)	(cfs-hr)	(cfs-hr)	(cfs-hr)	(cfs-hr)
11		2	1	0				3			0	0	
11.3	0.3	2	2	0				4	3.5	1.05	0.6	0.6	0
11.6	0.3	3	3	0				6	5	1.5	0.9	0.9	. 0
11.9	0.3	11	16	0				27	16.5	4.95	3.3	4.8	0
12	0.1	21	31	1				53	40	4 .	2.1	3.1	0.1
12.1	0.1	41	48	1				90	71.5	7.15	4.1	4.8	0.1
12.2	0.1	67	30	2				99	94.5	9.45	6.7	3	0.1
12.3	0.1	55	10	3				68	83.5	8.35	5.5	1	0.2
12.4	0.1	30	7	3				40	54	5.4	3	0.7	0.3
12.5	0.1	18	6	2				26	33	3.3	1.8	0.6	0.3
12.6	0.1	12	5	1				18	22	2.2	1.2	0.5	0.1
12.7	0.1	10	4	1				15	16.5	1.65	1	0.4	0.1
12.8	0.1	8	4	1		,		13	14	1.4	0.8	0.4	0.1
13	0.2	6	3	1				10	11.5	2.3	1.2	0.6	0.1
13.2	0.2	5	3	0				8	9	1.8	• 1	0.6	0.2
13.4	0.2	. 4	2	0				6	7	1.4	0.8	0.4	0
13.6	0.2	4	2	0				6	6 '	1.2	0.8	0.4	0
13.8	0.2	4	2	0 ·				6	6	1.2	0.8	0.4	0
14	0.2	3	2	0				5	5.5	1.1	0.6	0.4	0
14.3	0.3	3	2	0				5	5	1.5	0.9	0.6	0
14.6	0.3	3	2	0				5	5	1.5	0.9	0.6	0
15	0.4	2	1	0				3	4	1.6	0.8	0.4	0
15.5	0.5	2	1	0				3	3	1.5	1	0.5	. 0
16	0.5	2	1	0				3	3	1.5	i	0.5	. 0
16.5	0.5	2	1	0				3	3	1.5	i	0.5	. 0
17	0.5	2	1	0				3	- 3	1.5	i	0.5	0
17.5	0.5	1	, 1	0				2	2.5	1.25	0.5	0.5	0
18	0.5	1	1	0				2	2	1	0.5	0.5	0
19	1	1	1	0				2	2	2	1	1	0
20	1	1	1	0				2	2	2	1	i	. 0.
22	2	1	1	0				2	2	4	2	2	0
26	4	0	0	0				0	1	4	Õ	0	0
												,	J
• "								OTAL (c		84.25	47.8	32.2	1.7
								OTAL (g		2268684	1287158.4	867081.6	45777.6
							. 1	OTAL (g	pm):		825.1	555.8	29.3

FAIRF	AX TER	MINA	l. STO					MENT BA	SIN		•		•				
CONT	RIBUTIO	ON FR	OM:		Citgo '	Termin	al		10	YR STORM			:		•		
TIME	TINT	0/1)	0/1	04	044						VOLUME	VOLUME	VOLUME	VOLUME	VOLUME	VOLUME	
(hrs)		-1-7	- ' '					TOTQ	QAVG	VOLUMĘ	CI(1)	CI(2)	CI(3)	CI(4)	CI(5)	CI(6)	
(1113)	(hrs)	(cfs)	(cfs)	(cfs)	(cls)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs-hr)	(cfs-hr)	(cfs-hr)	(cfs-hr)	(cfs-hr)	(cfs-hr)	(cfs-hr)	
11		0	0	0	0	1.1	0	1			0	. 0	0	. 0	. 0	0	
11.3	0.3	0	0	0	0	1	0	1	1	0.3	. 0	0	0	. 0	0.3	0	
11.6	0.3	0	1	0	. 0	1	0	2	1.5	0.45	. 0	0.3	Ŏ	Ô	0.3	0	
11.9	0.3	2	4	2	3	9	Ĺ	21	11.5	3.45	0.6	1.2	0.6	0.9	2.7	0.3	
12	0.1	3.	8	4	6	18	3	42	31.5	3.15	0.3	0.8	0.4	0.6	1.8	0.3	
12.1	0.1	5	.12	8	9	28	5	67	54.5	5.45	0.5	1.2	0.8	0.9	2.8	0.5	
12.2	0.1	3	8	10	6	17	3	47	57	5.7	0.3	0.8	1	0.6	1.7	0.3	
12.3	0.1	1	3	6	2	6	1	. 19	33	3.3	0.1	0.3	0.6	0.2	0.6	0.3 0.1	
12.4	0.1	1	2	3	1	4	1	12	15.5	1.55	0.1	0.2	0.3	0.1	0.4		
12.5	0.1	1	1	2	ì	3	1	9	10.5	1.05	0.1	0.1	0.2	0.1	0.3	0.1 0.1	
12.6	0.1	0	1	2	1	3	1	8	8.5	0.85	0	0.1	0.2	0.1	0.3		
12.7	0.1	0	1,	1	1	2	0	. 5	6.5	0.65	0	0.1	0.1	0.1	0.2	0.1	
12.8	0.1	0	1	1	1	2	0	5 ]	5	0.5	0	0.1	0.1	0.1	0.2	0	
13	0.2	0	1	1	1	2	0	5	. 2	1	0	0.2	0.2	0.1	0.4	0	
13.2	0.2	0	1	.1	ı	2	0	5	5	. 1	0	0.2	0.2	0.2	0.4	0	
13.4	0.2	0	1	1	1	1	0 -	4	4.5	0.9	. 0	0.2	0.2	0.2	0.4	0	
13.6	0.2	0	1	1	0.	1	Ō	3	3.5	0.7	. 0	0.2	0.2	.0	0.2	. 0	
13.8	0.2	0	1	1	Q	1	0	3	3 .	0.6	0	0.2	0.2	0		0	
14	0.2	0	0	1	0	1	0	2	2.5	0.5	0	0.2	0.2	0	0.2 0.2	0	
14.3	0.3	0	0	1	0	1	0	2	2	0.6	0	0	0.3	0.		. 0	
14.6	0.3	0	0	0	0	1	0	1	1.5	0.45	. 0	0	. 0	0	0.3	0	
- 15	0.4	0	0	0	0	1	0	1	. 1	0.4	0	0	. 0		0.3	0	
15.5	0.5	0	0	0	0	1	· 0	1	41	0.5	,	0	0	0.	0.4	0.	
16	0.5	0	0	0	0	. 1	0	1	1	0.5	. 0	0	0	0	0.5	0	
16.5	0.5	0	0	0	0	1	0	1	. 1	0.5	o .	. 0	. 0		0.5	0	
17	0.5	0	0	0	0	1	0	1	1	0.5	0	. 0	0	0	0.5	. 0	
17.5	0.5	0	0	0	0	1	0	1	1	0.5	0	ő	0	0	0.5	0	
18	0.5	0	0	0	0	0	0	0	0.5	0.25	Ō	0	-	0	0.5	0	
. 19	1	· 0	0	0	0	0	0	0	0	0	0		0	0	0	0	
20	1	0 .	0	0	0	0	0	0.	0	0	0	•	0	0	0	0	
22	2	0	0	0	0	0	0	. 0	Ö	Ö	0	0	0	0	0	0	1
26	4 -	0	0	0	0	0	0	0	Ŏ	. 0	•	0	0	0	0	0	
							-	•		v	0	. 0	. 0	. 0	. 0	0	
								TOTAL (		35.3	2	6.2	5.8	4.3	16.7	1.0	
								TOTAL (		950558.4	53856	166953.6	156182.4	115790.4	449697.6	1.8 48470.4	
							. 1	OTAL (	gpm):		34.5	107.0	100.1	74.2	288.3	31.1	

TARE	T INT	0/15	0.3		45.4.							VOLUME	<b>VOLUME</b>	VOLUME	<b>VOLUM</b>
									QAVG	VOLUME	CH(1)	CH(2)	CH(3)	CH(4)	CH(5)
hrs)	(hrs)	(cfs)	(cts)	(cls)	(cls)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs-hr)	(cfs-hr)	(cfs-hr)	(cfs-hr)	(cfs-hr)	(cfs-hr)
11		0	0	0.	ł	0		. 1			0	0	0	0	
11.3	0.3	0	0	0	. 2	·		3	2	0.6	. 0	. 0	0	0.6	0.3
11.6	0.3	0	0.	1	2	1		4	3.5	1.05	0	0	0.3	0.6	0.:
11.9	0.3	0	2	3	15	7		27	15.5	4.65	0	0.6	0.9	4.5	2.
12	0.1	0	- 5	6	.30	13		54	40.5	4.05	0	0.5	0.6	. 3	1.
12.1	0.1	1	7	10	47	- 21		86	70	7	0.1	0.7	1	4.7	2.
12.2	0.1	1	5	6	29	13		54	70	7	. 0.1	0.5	0.6	2.9	1.3
12.3	0.1	2	2	2	10	4		20	37	3.7	0.2	0.2	0.2	1	0.4
12.4	0.1	4	1	i	7	3		16	18	1.8	0.4	0.1.	0.1	0.7	0.:
12.5	0.1	5	1	I,	6	3		16	16	1.6	0.5	0.1	0.1	0.6	0.
12.6	0.1	6	ı	ı	5	2		15	15.5	1.55	0.6	0.1	0.1	0.5	0.
12.7	0.1	6.	1	. 1	4	2		14	14.5	1.45	0.6	0.1	0.1	0.4	0.
12.8	0.1	5,	1	1	4	2		13	13.5	1.35	0.5	0.1	0.1	0.4	0.
13	0.2	4	0	1	3	ı		9	11	2.2	0.8	0	0.2	0.6	0.
13.2	0.2	3	0	ı	3	1		8	8.5	1.7	0.6	0	0.2	0.6	0.
13.4	0.2	2	0	0	2	1		5	6.5	1.3	0.4	0	. 0	0.4	0.
13.6	0.2	2	0	- 0	2	1		· 5	- 5	. 1	0.4	. 0	0	0.4	0.
13.8	0.2	1	0	0	2	1		4	4.5	0.9	0.2	. 0	0	0.4	0.:
14	0.2	1	0	0	2	ı		4	4	0.8	0.2	0	0	0.4	0.
14.3	0.3	1	0	0	2	1		. 4	4	1.2	0.3	. 0	0	0.6	0.:
14.6	0.3	1	0	0	1	1	•	3	3.5	1.05	0.3	. 0	0	0.3	0.:
15	0.4	1	0	0	1	1		3	3	1.2	0.4	0	0	0.4	0.4
5.5	0.5	1	0	0	1	1		3	3	1.5	0.5	0	0	0.5	0.5
16	0.5	1	0	0	1	0		2	2.5	1.25	0.5	0	0	0.5	
6.5	0.5	0	0	0	1	0		1	1.5	0.75	0	0	0	0.5	
17	0.5	0	0	0	1	0		1	1	0.5	0	. 0	0	0.5	
7.5	0.5	0	0	0	1	0		t	1	0.5	0	0	0	0.5	
18	0.5	0	0	0	1	0.		· 1	1	0:5	0	. 0	0	0.5	ì
19	1	0	0	0	1	0		1	1	1	0	. 0	0	1	ì
20	1	. 0	0	.0	1	0		1	1	1	0	0	0	i	·
22	2	0	0	0	. 1	0		1	1	2	0	0	. 0	2	ì
26	4	0	0	0	0	0	•	0	0.5	2	0	0	0	. 0	·
								TOTAL (	cfs.hr)·	58.15	7.6	2			
					•			TOTAL (		1565863.2	7.6 204652.8	90794	4.5	31	11.7
								TOTAL (		1303003.2	204032.8	80784	121176	834768	315057.6

	AX TER							MENT BA		YR STORM	•	
CONTI	VIDO I IV	OIV I IX	COM. P	4OT.T	VA T	егшт	IIdT				VOLUME	VOLUME
TIME	TINT	Q(1)	Q(2)	Q(3)	Q(4)	Q(5)	Q(6)	TOT Q	Q AVG	VOLUME	ST(1)	ST(2)
(hrs)	(hrs)	(cfs)				(cfs)		(cfs)	(cfs)	(cfs-hr)	(cfs-hr)	(cfs-hr)
11		0 .	0					0			0	• • •
11.3	0.3	0	0					0	0	0 .	0	0
11.6	0.3	0	0					0	. 0	0	. 0	0
11.9	0.3	15	. 1				:	2	1	0.3	0.3	0.3
12	0.1	2	2			-		4	. 3	0.3	0.2	0.2
12.1	0.1	4	4				.`	8	6	0.6	0.4	0.4
12.2	0.1	2	2					4	6	0.6	0.2	0.2
12.3	0.1	1.	1					2	3.	0.3	0.1	0.1
12.4	0.1	1	1				•	· 2	2	0.2	0.1	0.1
12.5	0.1	0	0					0	1	0.1	0	. 0
12.6	0.1	. 0	0					0.	0	. 0	. 0	0
12.7	0.1	0	0					0	0	0	0	0 .
12.8	0.1	0	0	•				0	Ò	0	. 0	0
13	0.2	0	0					0	. 0	0	0	0.
13.2	0.2	Õ	. 0					. 0	0	0	. 0	0
13.4	0.2	Ō	0					0	0	. 0	0	0
13.6	0.2	C	. 0					0	0	-0	. 0	0
13.8	0.2	0	0					0	0	0	0	0
14	0.2	Ō	0					0	0	0	0.	Ó.
14.3	0.3	0	0					. 0	0	0	0	0
14.6	0.3	0	0					0	. 0	0	. 0	0
15	0.4	0	0			e I		0	0	0	*** 0	0
15.5	0.5	0	0					0	0	0	. 0	0
16	0.5	0	0					0	0	. 0	0	0
16.5	0.5	. 0	. 0					0	0	. 0	0	Ó
10.3	0.5	0	Ö					Ö	0	. 0	0	0
17.5	0.5	0	0					0	0	0	0	0
18	0.5	•	0				•	0	0	0	0	0
. 19	0.5	0	0					0	0	0	0	Ŏ
20	1	0	0					0	0	0	0	0
22	2	0	0					0	0	Ō	. 0	0
26	4	0	0					. 0	0	0	0	ō
								TOTAL	Cafa hab	2.4	1.3	1.3
									L (cfs-hr):	64627.2	35006.4	35006.4
						•		TOTAL		04021.2		•
		• .						TOTAL	L (gpm):		22.4	22.4

## TABLE A-6



## **NON-TERMINAL FLOW CALCULATIONS**

Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22301

Operation	Average Flow (gpm)	Flow Basis
OFF-1	24	OFF-1 flow characteristics are assumed to be comparable to T1; stormwater discharge from the 10-year storm event based on area is 42,822 / 233,288 * 131 = 24
OFF-2	83	OFF-2 flow characteristics are assumed to be comparable to T1; stormwater discharge from the 10-year storm event based on area is 147,617 / 233,288 * 131 = 83
OFF-3	1088	OFF-3 flow characteristics are assumed to be comparable to B1; stormwater discharge from the 10-year storm event based on area is 644,054 / 488,303 * 825 = 1088
OFF-4	1073	OFF-4 flow characteristics are assumed to be comparable to B1; stormwater discharge from the 10-year storm event based on area is 635,359 / 488,303 * 825 = 1073
OFF-5	88	OFF-5 flow characteristics are assumed to be comparable to B1; stormwater discharge from the 10-year storm event based on area is 51,926 / 488,303 * 825 = 88
OFF-6	98	OFF-6 flow characteristics are assumed to be comparable to B1; stormwater discharge from the 10-year storm event based on area is 57,775 / 488,303 * 825 = 98
OFF-7	88	OFF-7 flow characteristics are assumed to be comparable to T1; stormwater discharge from the 10-year storm event based on area is 156,202 / 233,288 * 131 = 88
CA	107	CA flow characteristics are assumed to be comparable to C2; stormwater discharge from the 10-year storm event based on area is 81,956 / 81,773 * 107 = 107
PR	248	PR flow characteristics are assumed to be comparable to T5; stormwater discharge from the 10-year storm event based on area is 139,416 / 113,565 * 202 = 248
ВА	135	BA flow characteristics are assumed to be comparable to T1; stormwater discharge from the 10-year storm event based on area is 240,590/233,288 * 131 = 135

Notes: 1. gpm = gallons per minute

## TABLE A-5



#### TERMINAL FLOW CALCULATIONS

Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22301

0	On a matical	Average	Flow Pools
Company	Operation	Flow	Flow Basis
51101/51/5		(gpm)	
BUCKEYE	Grassy/Bermed Area Storm Water	29	Volume of the storm water generated in area B3 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-1)
	Tank Dike Area and Perimeter Storm Water Office/Parking Area Storm Water	825 556	Volume of the storm water generated in area B1 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-1)  Volume of the storm water generated in area B2 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-1)
	· ·		Estimated percentage of the volume of storm water generated in area B2 during the 10 year storm (3.9%) divided by the duration of the runoff (26).
	Loading Rack Canopy Storm Water	21	hours). (See Table B-1)
	Office Wastewater	4	Estimated by Buckeye.
	Maintenance Bay Drain Water	2.5	Estimated water discharge through a maintenance bay floor drain (300 gallons) divided by estimated duration of discharge (2 hours).
	Fire Test and Spill Cleanup Water	1010	Estimated water discharge during a fire test (5,000 gallons) divided by the duration of the test (5 minutes) plus estimated water to cleanup a spill (100 gallons) divided by the cleanup time (10 minutes).
	Loading Rack Floor Drains Storm Water	14	Estimated percentage (2.5%) of the volume of storm water generated in area B2 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-1)
	Remediation Groundwater	4.7	Estimated water generated during monthly monitoring activities (1,400 gallons) divided by time to pump it to a vacuum truck (5 hours).
	Hydrostatic Test Discharge Water	444	Volume of largest aboveground storage tank (4,478,628 gallons) to be tested and discharged during the permit period divided by the duration of the discharge (1 week).
	Tank Bottom Water	10.4	Volume of the average amount of tank bottom water generated per tank (2,500 gallons) divided by the duration of discharge (4 hours).
СІТВО	Hydrostatic Test Discharge Water	350	Volume of largest aboveground storage tank (5,035,000 gallons) to be tested and discharged during the permit period divided by the duration of the discharge (10 days).
	Office, Parking Area Storm Water	142	Volume of the storm water generated in areas C1 and C2 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-2)
	Open Field Storm Water and Diked Tank Area Water	494	Volume of the storm water generated in areas C3, C4, C5, and C6 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-2)
	Loading Rack Storm Water	10	Estimated percentage of the volume of storm water generated in area C2 during the 10 year storm (9.4%) divided by the duration of the runoff (26 hours). (See Table B-2)
	Fire Test and Spill Cleanup Water	510	Estimated water discharge during a fire test (5,000 gallons) divided by the duration of the test (10 minutes) plus estimated water to cleanup a spill (100 gallons) divided by the cleanup time (10 minutes).
	Tank Bottom Water	33	Volume of the average amount of tank bottom water generated per tank (2,000 gallons) divided by the duration of discharge (1 hour).
	Office Wastewater	4	Estimated by CITGO.
TRANSMONTAIGNE	Office, Parking Area, and Perimeter Storm Water	130	Volume of the storm water generated in areas T2 and T3 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-3)
	Open Space Storm Water French Drains	131 -	Volume of the storm water generated in area T1 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-3) Intermittent flow.
	Bermed Tank Area Storm Water	535	Volume of the storm water generated in area T4 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-3)
	Truck Parking Area and Loading Rack Storm Water	202	Volume of the storm water generated in area T5 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-3)
	Fire Test and Spill Cleanup Water	510	Estimated water discharge during a fire test (5,000 gallons) divided by the duration of the test (10 minutes) plus estimated water to cleanup a spill (100 gallons) divided by the cleanup time (10 minutes).
	Tank Bottom Water	262	Volume of the average amount of tank bottom water generated per tank (15,700 gallons) divided by the duration of discharge to trucks for offsite disposal (1 hour).
	Monitoring Groundwater Office/Warehouse Wastewater	0.5 2	Estimated water generated during monitoring activities (275 gallons) divided by time to pump it (8 hours).  Estimated by TransMontaigne.
	Hydrostatic Test Discharge Water	240	Volume of largest aboveground storage tank (3,455,284 gallons) to be tested and discharged during the permit period divided by the duration of the discharge (10 days).
MOTIVA	Open Field Storm Water	42	Volume of the storm water generated in areas M1 and M2 during the 10 year storm divided by the duration of the runoff (26 hours). (See Table B-4)
	Hydrostatic Test Discharge Water	125	Volume of largest aboveground storage tank (1,800,000 gallons) to be tested and discharged during the permit period divided by the duration of the discharge (10 days).

Notes: 1. gpm = gallons per minute



# APPENDIX B

Storm Water Pollution Prevention Plan (excerpt)

## 3 TERMINAL COMPLEX

This Section describes terminal operations, storm water drainage patterns, and storm water management practices employed at the Complex. Facility-specific information is presented in **Sections 4, 5, 6** and **7** for the Buckeye, CITGO, TransMontaigne, and Motiva facilities, respectively.

#### 3.1 Fairfax Terminal Complex Storm Water Impoundment Basin

Storm water runoff is channeled through internal outfalls at the Complex and flows into the Basin located at the northwest corner of the Terminal Complex. Water is discharged from the Basin through a single external outfall, Outfall 001. There are two primary internal outfalls (Outfalls 101 and 102), and one contingent outfall (Outfall 103). Outfall 103 is used as a bypass to drain surface runoff under high rainfall situations. The location of Outfall 101 captures flow from the Buckeye oil/water separator and the culvert that runs south to north in this area. A Site Location Map is included as **Figure 2**, a Layout of Fairfax Terminal Complex is included as **Figure 3**, and a map of the current outfall sample locations is included as **Figure 4**.

The Basin was designed and constructed to capture storm water runoff from the Complex that would otherwise drain directly into Daniels Run. Under normal conditions, the Basin continuously discharges water and forms an unnamed tributary, which enters Daniels Run approximately 1,100 feet north of the Basin. The discharge from the Basin is permitted under VPDES Permit No. VA0001872. Drawings of the Basin and its cross-sections are included as **Figure 5** and **Figure 6**.

#### 3.1.1 Background Information

The Basin is an oblong body of water, formed by a man-made dam on the north side which blocks natural storm water drainage flow in that direction. The Basin discharges through a concrete weir on the north side into an un-named tributary to Daniels Run. The outfall is a 36-inch pipe protected with an iron gate.

Construction of the Basin was requested by the City of Fairfax as one of several required safety objectives for the Terminal Complex. The Basin was designed in 1967 by Nathan Hale Associates to capture the surface runoff from the Complex that would normally drain into Daniels Run. The design capacity of the Basin was based on retention of an average monthly rainfall event, with a mechanical spillway capacity for a 25-year storm, and an emergency spillway capacity for a 100-year storm. The Basin's approximate dimensions are 730 feet east to west and 140 feet north to south, with a surface area of roughly 2.4 acres. Based on that area, and an estimated average depth of 9 feet, the volume of the Basin is estimated to be approximately seven (7) million gallons. Basin construction was completed in September 1969.

Since May 15, 1993, storm water runoff from the current Buckeye, CITGO, and TransMontaigne terminals has been channeled into the Basin. Additionally, storm water runoff from non-terminal sources and approximately 0.8 acres in the northeast section of Motiva's property contribute to the Basin.

## 3.1.2 Sources of Water to the Storm Water Impoundment Basin

Storm water flowing into the Basin from the Terminal Complex area comes from each of the four bulk terminals, from Colonial Avenue, from the Basin area itself, and from off-site areas. In addition, the Colonial Pipeline facility in the center of the Terminal Complex contributes overland sheet flow to the Basin and point source discharge to the concrete culvert that drains into the Basin. Sources of water flowing into the Basin have been divided into two major groups: Terminal sources and Non-Terminal sources. The drainage areas were determined based on information from topographic and utility maps, water management practices at each terminal facility, and visual observation and are shown on **Figure 7**. The main drainage areas are further broken out into sub-areas, as shown on **Figure 8**.

#### 3.1.2.1 Terminal Sources

Terminal sources include storm water flowing from each of the four terminals, from Colonial Avenue, and from the Basin area. Storm water management activities at each of the four facilities are detailed in **Sections 4** through **7** of this document. These include: B1 through B3 (Buckeye); C1 through C6 (CITGO); T1 through T5 (TransMontaigne); and M1 and M2 (Motiva). Runoff from Colonial Avenue (CA) flows into the Basin after passing through culverts along Colonial Avenue and through the western portion of the CITGO property. Storm water runoff from the sub-area immediately around the Basin (BA), and rainwater falling directly into the Basin are also included as Terminal sources.

#### 3.1.2.2 Non-Terminal Sources

Three main non-terminal areas discharge water into the Basin. These include a residential area south and west of the Complex (OFF1 through OFF6), a golf course north of the Complex (OFF7), and Pickett Road and a commercial area east of the Complex (PR).

The residential area, which has been divided into six drainage sub-areas (OFF1 through OFF6) based on topographic flow paths, includes portions of three separate residential developments. Storm water from a small part of Little River Hills (OFF1 and OFF2), a development of single family homes located to the west of the Complex residential complex, drains into the Basin after flowing overland to the concrete-lined channel, or to a separate channel located along the western boundary of the Basin area. Part of Lyndhurst condominium complex (OFF3) drains to the Basin, flowing overland to the concrete-lined channel on CITGO's property. A large area of the Comstock residential complex and another part of the Lyndhurst condominium complex, located west of Buckeye (OFF4) drain through a pipe under Buckeye's retention basin into a concrete-lined channel that crosses Buckeye and CITGO property and discharges directly to the Basin. Drainage from two small areas at the Comstock residential complex, a group of townhouses located south of the Buckeye terminal (OFF5 and OFF6), drain into a single pipe and then flow into a storm water staging area on the Buckeye property. A section of the Army Navy Country Club golf course located north of the TransMontaigne terminal (OFF7) contributes storm water runoff overland directly to the Basin. Storm water runoff from a portion of Pickett Road and several commercial businesses located east of Pickett Road (PR) flows into the Basin through a storm sewer pipeline that runs across the northern part of the TransMontaigne property.

#### 3.2 Discharge Sampling

This section describes the sampling and analysis procedures that are conducted at the Complex to monitor the quality of storm water discharges. Discharge sampling is required to comply with VPDES permit VA0001872. A copy of this permit is provided in Appendix A. Discharge samples are collected at monthly, quarterly, semi-annual, annual, and five (5)-year frequencies as prescribed in the permit. As of March 2010, TransMontaigne maintains a General VPDES Permit for Petroleum Contaminated Sites and Hydrostatic Tests (VAG830359) that is handled independently of the Joint Basin Corporation.

#### 3.2.1 Sampling Locations, Frequencies and Analyses

Sampling is conducted regularly at several outfalls at the Complex. These include several internal and one external outfall, as shown on **Figure 4**. Sampling is performed in accordance with the specifications and requirements listed in the VPDES permit and the requirements outlined in each analytical method. These requirements include general and method-specific sample preservation techniques. All samples are collected in laboratory-supplied bottleware, preserved in accordance with the analytical method, and placed on ice immediately after sample collection.

#### 3.2.1.1 External Outfall 001/901

The Complex has one external outfall (Outfall 001) located along the northern edge of the Basin. It consists of a concrete pipe that penetrates the northern levee of the pond and discharges to an unnamed tributary to Daniels Run. This tributary runs north through the Army Navy Country Club golf course located north of the Complex.

Outfall 001 is sampled once per month for pH, total petroleum hydrocarbons (TPH), and total suspended solids (TSS) and the flow rate is estimated during each sampling event. Field pH analyses are performed using equipment approved by the VADEQ. Once every six months, additional analyses are performed on the sample collected from Outfall 001: benzene, toluene, ethylbenzene, total xylenes (BTEX), methyl tertbutyl ether (MTBE), and naphthalene. Specific requirements regarding TPH, TSS, BTEX, MTBE, and naphthalene analytical methods are listed in the VPDES permit included as Appendix A. Annually, Outfall 001 is sampled for performance of biological toxicity testing. This sampling occurs following the initiation of a rainwater discharge event. Specific requirements for this sampling and analysis are provided in Part I, Section C of the VPDES permit.

Outfall 001 is also designated as Outfall 901 for the purpose of sampling after storm events. This additional "outfall" is sampled on a quarterly basis after the occurrence of a measurable storm event. A measurable storm event is characterized as any storm event that results in actual discharge from the site that is preceded by a minimum of 72 hours without a measurable storm event. Based on the capacity of the Basin, it has been calculated that runoff from rain events will typically take approximately 24 hours to reach the outfall. Therefore, samples for Outfall 901 are collected 24 hours after the qualifying rain event. Rainfall measurements are taken from the Mantua weather station (KVAFAIRF25) located 1.18 miles northeast of the Complex as shown on **Figure 2**.

In accordance with Part I, Section D of the VDPES permit, quarterly visual inspections are conducted during Outfall 901 sampling events. The visual inspections include observations for color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheens, or other obvious indicators of pollution. Records of visual inspections are maintained on-site in the JBC file storage area at the Buckeye office.

#### 3.2.1.2 Outfalls 101 and 102

Samples are collected from internal Outfalls 101 and 102 to monitor water discharging to the Basin from the Buckeye and TransMontaigne oil/water separators. Each outfall is sampled once per quarter for TPH and the flow rate is estimated during each sampling event.

#### 3.2.1.3 Outfall 103

Outfall 103 is located on the TransMontaigne property. Outfall 103 typically remains closed, but it is used as needed to handle discharges from heavy rainfall events. This outfall is sampled for TPH and the flow rate is estimated in accordance with the VPDES permit. The last time that Outfall 103 was sampled was in April 2014.

#### 3.2.1.4 Outfall 106

Hydrostatic testing may be conducted at any of the storage tanks within the Complex, and discharges from the test to the Basin are labeled Outfall 106. The JBC is required to provide a 48-hour advance notice to the VADEQ before discharge of test water occurs. Samples are collected at two times during discharge from the tank. The first sample is collected at the beginning of the discharge and the second sample is collected when 20 percent by volume or 2 feet are remaining in the tank. Samples are analyzed for pH, TPH, total organic carbon (TOC), TSS, BTEX, naphthalene, and total residual chlorine. Flow rate must also be estimated during sampling.

### **VPDES Effluent Limitations**

Outfall	Effluent Characteristics	Discharge Requirements	Sampling Frequency
001 – External Outfall for Basin	Flow	No limit	Monthly
	pH	6.0 – 9.0	Monthly
	TSS	60 mg/L	Monthly
	ТРН	15 mg/L	Monthly
	Ethylbenzene	320 μg/L	Semi-annually
	Benzene	50 μg/L	Semi-annually
	Toluene	175 μg/L	Semi-annually
	Naphthalene	10 μg/L	Semi-annually
	Methyl tert-Butyl Ether	1840 μg/L	Semi-annually
	Total Xylenes	33 μg/L	Semi-annually
	Whole Effluent Toxicity Chronic – TUc – C. dubia	No limit	Annually
	Whole Effluent Toxicity – TUc – P. promelas	No Limit	Annually
901 – Storm Water	Flow	No limit	Quarterly
	pH	6.0 - 9.0	Quarterly
	TSS	60 mg/L	Quarterly
	TPH	30 mg/L	Quarterly
101 – Buckeye OWS	Flow – Internal Outfalls 101 and 102	No limit	Quarterly
102 – TransMontaigne OWS	Flow – Internal Outfall 103	No limit	Per discharge
103 – TransMontaigne Bypass	TPH – Internal Outfalls 101 and 102	15 mg/L	Quarterly
	TPH – Internal Outfall 103	30 mg/L	Per discharge
106 – Hydrostatic Test Waters	Flow	No limit	2 Per tank test
	рН	6.0 – 9.0	2 Per tank test
	TSS	No limit	2 Per tank test
	TPH	15 mg/L	2 Per tank test
	TOC	No limit	2 Per tank test
	Total Residual Chlorine	0.016 mg/L	2 Per tank test
	Ethylbenzene	320 μg/L	2 Per tank test
	Benzene	50 μg/L	2 Per tank test
	Toluene	175 μg/L	2 Per tank test
	Naphthalene	10 μg/L	2 Per tank test
	Total Xylenes	33 μg/L	2 Per tank test
Notes: mg/L = milligrams per liter $\mu g/L = micrograms per liter$			

#### 3.2.2 Water Quality Requirements

As discussed previously, VPDES Permit No. VA0001872 establishes water quality standards for all internal and external outfalls. A copy of the permit, effective December 28, 2009 and expiring December 28, 2014 is included in Appendix A. Copies of sampling and analytical data are retained in the JBC file storage area at the Buckeye office. Recordkeeping for storm water compliance information is detailed in Section 9.

#### 3.3 Best Management Practices

This section presents best management practices (BMPs) used for general storm water pollution prevention at the Complex. Specific pollution control measures for each facility are presented in Sections 4 through 7.

#### 3.3.1 Structural Controls

Structural controls are utilized by each facility at the Complex to reduce potential contamination in storm water discharges. General controls are described below and are detailed for each facility in **Sections 4** through **7**.

#### 3.3.1.1 Containment Diking

Containment diking is utilized as an effective pollution prevention and emergency overflow measure for all aboveground storage tanks. Containment dike walls surround the storage tank areas at each facility. Inspections of containment diking are conducted daily as well as during and after significant storms or spills to check for washout or overflows.

#### 3.3.1.2 Retention Basins

In addition to containment diking, Buckeye, CITGO, and TransMontaigne each have storm water retention basins or collection areas at their facilities to allow for inspection of storm water before discharge to the Basin. By employing this BMP, retained storm water runoff can be inspected prior to pumping or gravity discharge to the Basin. Motiva does not have or need any retention of runoff for the portion of the facility that drains to the Basin.

#### 3.3.1.3 Runoff Channels and Storm Drains

Storm water conveyances such as runoff channels and storm drains collect storm water runoff and direct its flow. Each facility has a network of storm drains and runoff channels that create a storm water collection system. These systems are used to prevent temporary flooding of the terminal facilities. The storm water runoff channels and storm drains are routinely inspected and cleared of debris when present.

#### 3.3.1.4 Tank Truck Loading Racks

Each facility has a tank truck loading rack. In accordance with typical BMPs, the loading racks at Buckeye, CITGO, and TransMontaigne are covered to prevent rainwater from coming into contact with fueling

activities. All three of the loading racks that are in the drainage area of the Basin are outfitted with curbing and/or sloped pavement surfaces to direct runoff to designated collection systems. Runoff from the ground-level drains at the CITGO and TransMontaigne loading racks is collected and disposed of off-site. The TransMontaigne loading rack has a bypass valve that is normally closed and directs the flow to a holding tank. During excessive rainfall, the bypass can be opened to direct flow to the oil/water separator before discharging to the Basin. Ethanol offloading is also directed to the holding tank. Runoff from the drains at the Buckeye loading rack is treated in an oil/water separator before discharge to a holding vault and subsequently to the Basin. The rack at Motiva is not located in an area that drains to the Basin.

#### 3.3.1.5 Vehicle Washing Practices

BMPs dictate that vehicle washing should not be conducted in any outdoor areas or any other areas that come into contact with storm water. TransMontaigne operates an indoor washing bay, from which wash water discharges to a floor drain connected to the local sanitary sewer. Buckeye and CITGO do not have vehicle washing areas. Motiva does not have a vehicle washing area on the portion of their terminal which discharges to the Basin.

#### 3.3.1.6 Sediment and Erosion Control

Structural erosion prevention and sediment control practices are utilized throughout the Complex. The placement of gravel, vegetation, and paved surfaces is used to maintain the stability of steep slopes and dike walls and to minimize exposure of soil to wind and rain, and concrete-lined runoff channels and storm drains are used to avoid erosion of drainage ways. The collected storm water is then directed to intermediate collection/holding basins and oil/water separators for flow detention. Intermediate collection basins are useful in reducing downstream flow velocity and preventing erosion. Treated storm water is then routed via additional aboveground concrete-lined channels and underground concrete pipes to the Basin. The Basin was constructed to collect all storm water that would otherwise drain immediately to Daniels Run. The Basin serves an important downstream function by lessening any potential surge of storm water runoff from the Complex and surrounding areas. The Basin also serves to remove sediment, which is accomplished through holding the storm water in the Basin and allowing the solids to settle.

When construction projects are conducted at the Complex, contractors must obtain all required permits and conduct all activities in accordance with all local sediment and erosion control regulations.

#### 3.3.2 Non-Structural Controls

This section outlines non-structural pollution prevention practices that are required to minimize the possibility of storm water coming into contact with potential pollution sources, maintain treatment controls, and drainage systems. Good housekeeping and routine site inspections are examples of non-structural pollution prevention practices that are utilized at the Complex.

#### 3.3.2.1 Inspections and Preventative Monitoring

Routine inspections are conducted by qualified personnel at each terminal. At Buckeye, inspections are performed twice daily, weekly, and monthly. At CITGO, inspections are conducted daily and monthly. At TransMontaigne, inspections are conducted daily and monthly. At Motiva, inspections are conducted daily. Upon completion of the inspections, the person conducting the inspection documents the inspection in their facility's records logs. Visual inspections include the following:

- 1. A complete walkthrough of the facility property to ensure that no hazardous conditions exist.
- 2. An inspection of ground surface for signs of leakage, spillage, or stained or discolored soils.
- 3. A check of the berm or dike area for excessive accumulation of water and to ensure the dike or berm manual drain valves are secured.
- 4. A visual inspection of exterior tank shells to look for signs of leakage or damage.

At least once per calendar year, the routine quarterly facility inspection is conducted when a storm water discharge is occurring.

#### 3.3.2.2 Storage Tank and Pipeline Testing

Petroleum products are piped directly to each individual facility via pipeline and stored in aboveground tanks. An inventory of materials handled and stored at each facility located within the area draining to the Basin are included for Buckeye, CITGO, TransMontaigne, and Motiva in **Table 1**.

Procedures for maintaining and testing the integrity of all storage tanks and piping are conducted in accordance with Virginia regulations relating to aboveground storage tank operation. These regulations are outlined in VAC 25-91-10 through 220.

#### 3.3.2.3 Preventative Maintenance and Good Housekeeping

Preventative maintenance and good housekeeping are used to greatly reduce the possibility of storm water pollution. Equipment that might be a potential source of storm water contamination, such as loading racks, tanks, piping, and oil/water separators must be kept in good working order at all times. All companies operating at the Complex perform frequent inspections of equipment to confirm that it is operating properly and repairs and maintenance are performed on a regular basis.

Areas which may contribute pollutants to storm water discharges should be kept in a clean, orderly manner. Driveway surfaces are kept clean. Loading rack areas are routinely inspected and outfitted with proper spill cleanup equipment and procedures. Materials that might contribute contamination to storm water should not be stored in areas that are exposed to rainfall or runoff in order to minimize exposure. Other pollution-preventing practices including signs and labels, security, area control procedures, visual inspections, and routine clean-up schedules are in place to mitigate potential pollutant sources.



APPENDIX C 2011, 2012, and 2013 Toxicity Monitoring Reports



2109A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804) 358-8295 Fax: (804) 358-8297

### Certificate of Analysis

#### Final Report

#### Laboratory Order ID 11060252

Client Name: URS-Corporation

13825 Sunrise Valley Drive Ste 250

Herndon, VA 20171

Date Received:

June 14, 2011

Date Issued:

June 20, 2011

Submitted To: Lindsay Pierce

ay Pierce Project Number:

39450473.01

Client Site I.D.: JBC Fairfax Terminal

Purchase Order

Subcontract #125770.US

Sample Summary List

Laboratory

Sample ID

Sample ID

**Sample Date** 

**Receive Date** 

11060252-001

PS-001

06/13/2011

06/14/2011

**Ted Soyars** 

Laboratory Manager

#### **End Notes:**

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a dry weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

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2109A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804) 358-8295 Fax: (804) 358-8297

### Certificate of Analysis

#### Final Report

### Laboratory Order ID 11060252

Client Name: **URS-Corporation** 

Date Received:

13825 Sunrise Valley Drive Ste 250

Herndon, VA 20171

Date Issued:

June 14, 2011

June 20, 2011

Submitted To: Lindsay Pierce

**Project Number:** 

39450473.01

Client Site I.D.: JBC Fairfax Terminal

Purchase Order

Subcontract #125770.US

-Analytical Results -

Sample I.D.: PS-001

Date/Time Sampled: 06/13/11 10:35

Laboratory Sample I.D.: 11060252-001

Parameter	Method	Sample Results	Qual Rep Limi	Samp Prep Date/Time	Date/Time	Analyst
TPH-Semi-Volatiles (DRO)	SW8015C	< 0.5 mg/L	0.5	06/15/2011 10:2	0 06/15/2011 19:25	JHV
TSS	SM18/2540D	5.6 mg/L	1	06/14/2011 16:5	0 06/14/2011 16:50	JPV

#### Summary of Analytical QC Batches

QC Batch ID Method QC110615031 SM18/2540D QC110616009 SW8015C

Sample List 11060252-001 11060252-001



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Sample Condition Form#: F1302 Rev. #: 1.0 Effective: August 2, 2010 Page 1 of 1



Lab ID No.:

2109A North Hamilton Street • Richmond, Virginia 23230 • Tel:

URS-Herndon

11060252

JBC Fairfax Terminal

DUE: 5 Days Recd: 06/14/11

Sample Conditions Check

Opened by: (Initials)

Date Cooler Opened:

N/A YES NO How were samples received? 1. Fed Ex UPS Courier Walk In Were custody seals used? 2. If yes, are custody seals unbroken and intact at the date and time of arrival? 3. Are the custody papers filled out completely and correctly? 4. Do all bottle labels agree with custody papers? 5. 6. Are the samples received on ice? Is the temperature blank or representative sample within acceptable limits? 7. (above freezing to 6°C) Are all samples within holding time for requested laboratory tests? 8. Is a sufficient amount of sample provided to perform the tests indicated? 9 Are all samples in proper containers for the analyses requested? 10 Are all samples appropriately preserved for the analyses requested? 11 Are all volatile organic containers free of headspace? 12 COMMENTS



June 24, 2011

Fairfax Terminal Complex Sample ID: Outfall 001 NPDES#: VA0001872 JRA ID: 11-08405

Chronic *Ceriodaphnia dubia* Toxicity Test Chronic *Pimephales promelas* Toxicity Test

> Performed for: URS Corporation Lindsay Pierce

13825 Sunrise Valley Drive Suite 250 Herndon, VA 20171

Performed by:

James R. Reed & Associates 770 Pilot House Dr. Newport News, VA 23606

Respectfully,

Elaine Claiborne Laboratory Director

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The results of this report relate only to the sample(s) provided for analysis.

VELAP# 460013

Results conform to NELAC standards, where applicable, unless otherwise indicated.

EPA# VA00015



# TEST SUMMARY SHEET (For Marine and Freshwater Tests) EPA 1002.0

Facility:	Fairfax Terminal Complex			N	NPDES Permit #:		
Outfall/Re	Outfall/Receiving Stream: 001				JRA #:	11-08405	
		h Data is Bei niannual, or a		d: <u>A</u>	nnual test		
		\$	SUMMARY	OF TEST CO	NDITIONS		
	Test Star	t:		Date 6/14/2011	Time 1130	_	
	Test End	• •		6/21/2011	0830	_	
	Test Type (chronic/acute):		Chronic				
	Test Orga	anism:	Ceriodap	hnia dubia	Age:	<24 hour	
	Test Char	mber Size:	30 mL				
	Volume o	of Test Soluti	on per Chan	nber: <u>15</u>	mL	_	
	Diluent:	20% DM	W				
	Test Chamber Aeration Period Test Photoperiod: Feeding regime:		None 16hrs light / 8 0.1 mL S.capri				
		RA	NGE OF C	HEMICAL PA	RAMETERS		
	Paramete	er		Effluent		Diluent	
	1. <u>Chlori</u>	ne (mg/L) Initial		<0.02		<0.02	
		Adjusted		N/A			
	2. <u>Salinit</u>	<u>y (ppt)</u> Initial		<1		N/A	
		Adjusted		N/A			
	3. <u>pH</u>	Initial Adjusted		7.09-7.60 N/A		7.80-8.15	

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JRA #:	11-08405	Test Type&Organism:	Chronic Ceriodaphnia dubia						
RANGE OF CHEMICAL PARAMETERS (Continued):									
D		T3 00	<b></b>						

Parameter		Effluent	Diluent				
4. Alkalinity (mg/L as	CaCO <sub>3</sub> )	19-25	60-63				
5. Ammonia (mg/L)		N/A	N/A				
6. Hardness (mg/L as	CaCO <sub>3</sub> )	27-28	80-81				
7. Conductivity (µmho	os/cm)	110-115	179-184				
8. <u>DO (mg/L)</u>		7.8-8.4	8.1-8.4				
9. Methods Used for Adjustment of Test Solutions							
Chlorine	N/A						
Salinity	N/A						
pН	N/A						

### **TEST RESULTS**

### 1. Test Acceptability

Control Survival (%)	100%
Average Weight per Control Organism (mg)	N/A
Average Number of Young per Control (C. dubia)	25.7
60% of Control Females (C. dubia) with 3 Broods?	yes
Total Number of Male <i>C. dubia</i> in the Test Known Parentage? N/A	None
Percent Females Producing Eggs (M. bahia)	N/A

### 2. Method(s) of Statistical Analyses

Survival:	Fisher's Exact Test
Reproduction:	Dunnett's Test
IC25:	Linear Interpolation
LC50( at 48 hours):	Visual observation

### TEST RESULTS (Continued)

### 3. Statistical Results (as appropriate)

Reproduction (NOEC) 100% (LOEC) >100%  Normal Distribution (yes/no) yes  Homogeneous Variance (yes/no) yes  TUc
Normal Distribution (yes/no) yes Homogeneous Variance (yes/no) yes TUc
Homogeneous Variance (yes/no) yes  TUc
TUc1
PMSD 30.0%
Reference Toxicant Test Date 6/10/2011
ID No. <u>T00072</u>
Result (mg/L) $0.0025$
QC Range (mg/L) $0.00125$ thru $0.005$
4. Equipment (Make Model Serial # Probe #)
pH meter VWR SB21 00005173 F1
DO meter YSI 5000 97J0177 N
SCT meter Orion 3 Star 000642 A1
Temperature VWR digi-thermo N/A N/A
Chlorine HACH Colorimeter <sup>TM</sup> II 00000994 N/A
5. Protocol Deviations/Comments
5. <u>Totocor Beviations/Comments</u>

## EFFLUENT USE SHEET (CHRONIC RENEWALS)

Facility: Fairfax Terminal Complex

VPDES Permit # VA0001872

Outfall/Receiving Stream: <u>001</u>

JRA#: <u>11-08405</u>

Test/Organism:

Chronic Ceriodaphnia dubia

SAN	IPLE COLL	ECTION						
Date(s)		Time	(s)		SAMPLE USE			
From:	To:	From:	To:	Date(s)	Time(s)	Test Day		
6/12/11	6/13/11	1000	0900	6/14/11	1130	0		
6/13/11	6/14/11	1035	0935	6/15/11	1130	1		
				6/16/11	1000	2		
6/15/11	6/16/11	1030	0930	6/17/11	1055	3		
				6/18/11	1140	4		
				6/19/11	0930	5		
				6/20/11	0930	6		

The first use of a sample must be within 36-hours of retrieval from the sample collection device. Last use of sample must be within 72 hours of first.

### TEST SUMMARY SHEET (For Marine and Freshwater Tests) EPA 1000.0

				EFA 1000.	U		
Facility:	Fairfax To	erminal Comp	olex		NPDES P	ermit #:	VA0001872
Outfall/Re	ceiving Stre	eam:	001		<u></u>	JRA #:	11-08405
		Data is Beingiannual, or an	-	<b>l</b> :	Annual tes	st	
		SI	U <b>MMARY</b>	OF TEST	CONDITIO	ONS	
	Test Start:	:		Date 6/14/2011		Time 1130	-
	Test End: Test Type (chronic/acute)			6/21/2011		1040	-
			te):	Chronic		-	
	Test Organ	nism:	Pimephale	es promelas	_	Age:	24-48 hour
	Test Chan	nber Size:	500mL				
	Volume of Test Solution per Cha			iber:	250mL		
	Diluent:	20% DMW	,				
	Test Chamber Aeration P Test Photoperiod: Feeding regime:			None 16 hrs light	-c) per replicate twice daily		
		RAN	GE OF CH	HEMICAL	PARAME'	ΓERS	
	Parameter	r		Effluent			Diluent
	1. Chlorin	<u>ie (mg/L)</u> Initial		<0.02			<0.02
		Adjusted		N/A			
	2. Salinity	<u>(ppt)</u> Initial	14	<1			N/A
		Adjusted		N/A			
	3. <u>pH</u>	Initial		6.35-7.47			7.21-8.14

N/A

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Adjusted

JRA #:	11-08405	Test Type&Organism: Cl	nronic <i>Pimephales promelas</i>
	RANGE OF CHEM	ICAL PARAMETERS (Cor	
Paramet	er	Effluent	Diluent
4. <u>Alkali</u>	nity (mg/L as CaCO <sub>3</sub> )	19-25	60-63
5. <u>Amm</u> e	onia (mg/L)	N/A	N/A
6. <u>Hardn</u>	ess (mg/L as CaCO <sub>3</sub> )	27-28	80-81
7. <u>Condu</u>	activity (µmhos/cm)	110-115	179-184
8. <u>DO (n</u>	ng/L)	5.5-8.4	5.9-8.4
9. Metho	ds Used for Adjustment	of Test Solutions	
	Chlorine N/A Salinity N/A pH N/A		
	1	EST RESULTS	
1. <u>Test A</u>	cceptability		
	Control Survival (%)		100%
	Average Weight per (	Control Organism (mg)	0.998
	Average Number of Y	Young per Control (C. dubia)	N/A
	60% of Control Fema	les (C. dubia) with 3 Broods?	N/A
	Total Number of Male Known Parentage?	e <i>C. dubia</i> in the Test  N/A	N/A
	Percent Females Prod	ucing Eggs (M. bahia)	N/A
2. Method	d(s) of Statistical Analys	es	
	Survival:	Steel's Many-One Rank Tes	et
	Growth:	Dunnett's Test	
	LC50 (at 48 hours):	Visual observation	
	IC25:	Linear Interpolation	
		• • • • • • • • • • • • • • • • • • • •	<del></del>

### **TEST RESULTS** (Continued)

### 3. Statistical Results (as appropriate)

	LC50 (at 4 TUa IC25 Survival	Normal D	Distribution ( aeous Varian	,	>100% <1 >100% 100% no N/A	- - (LOEC) -	>100%
	Growth			(NOEC)	100%	(LOEC)	>100%
		Normal D	istribution (	` ,	yes	_(====)	10070
		Homogen	eous Varian	ce (yes/no)		-	
	TUc				1	-	
	PMSD				10.4%	_	
	Reference 7	Foxicant Te	est Date		6/14/2011	_	
		ID No.			T00074	_	
		Result (m	• /		0.02	_	
		QC Range	e (mg/L)		0.01	thru	0.04
4. Equipme	<u>ent</u>	(Make	Model		Serial #		Probe #)
pH meter		VWR	SB21		00005173		F1
DO meter		YSI	5000		97J0177		N
SCT meter		Orion	3 Star		000642		A1
Temperature	e	VWR	digi-therm	0	N/A	·	N/A
Chlorine		НАСН	Colorimete	er <sup>TM</sup> II	00000994		N/A
5. Protocol	Deviations/	Comments					
			<u> </u>	<del></del>			
							<del></del>
•							
•					·	<del> </del>	

## EFFLUENT USE SHEET (CHRONIC RENEWALS)

Facility

Fairfax Terminal Complex

VPDES Permit # VA0001872

Outfall/Receiving Stream: <u>001</u>

JRA#:

11-08405

Test/Organism:

Chronic Pimephales promelas

SAM	IPLE COLL	ECTION				
Date(	s)	Time	(s)		SAMPLE U	JSE
From:	To:	From:	To:	Date(s)	Time(s)	Test Day
6/12/11	6/13/11	1000	0900	6/14/11	1130	0
6/13/11	6/14/11	1035	0935	6/15/11	1130	1
				6/16/11	1130	2
6/15/11	6/16/11	1030	0930	6/17/11	1050	3
				6/18/11	1045	4
				6/19/11	0930	5
				6/20/11	1000	6

The first use of a sample must be within 36-hours of retrieval from the sample collection device. Last use of sample must be within 72 hours of first.

### **CUMULATIVE DATA SUMMARY**

### Fairfax Terminal Complex

NPDES: VA0001872

Effective date of current permit: <u>12/29/2009-12/28/2014</u>

### Outfall 001

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
6/14/201	1		100% TUc	=1 100% TUc=1

Chronic Ceriodaphnia dubia Survival and Reproduction Test

JRA# 11-08405

### **OBSERVATIONS**

NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001
START DATE: 6121111 TIME: 0830

			*****		24 .	¥	10			<del> </del>	
	2 8		7	NUMBER OF	YOUNG PRO	DDUCED PER	R DAY	<del>,</del>	<del>1</del>		_
CONC	REP	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	TOTAL	
CONTROL	1	0	0	13	7	0	11	10	Mary 10	31	Г
	2			२	8	0	0	10	* 4.	20	
	3			0	10	_ ר	11	10	N <sub>ij</sub>	38	
	4			0	0	6	9	0	FW2]	15	6
Mean young per	5				O	6	11	0		17	
	6			1	U	6	11	0		17	
25.7	7			2	9	0	12	13		36	
	8			0	8	0	12	10		30	
Survival: 00	9			0	1	0	ti	13		25	
	10		V	1 1	6	0	10	17		28	
DATE	2011	6115	6/16	6/17	6118	6/19	6120	6121			
TIME		1130	1000	1012	1140	0 930	1000	0830			ų.
INIT		4)	۷0	40	ley	دا	~D	CV -			

			N	JMBER OF Y	OUNG PRO	DUCED PER	DAY				
CONC	REP	DAY 1	DAY 2	DAY3	DAY4	DAY 5	DAY 6	DAY 7	DAY 8	TOTAL	
6.25%	1	0	0	2	8	0	11	12		33	
	2			2	9	9	Ó	13		33	
	3			0	10	0.	13	12		35	
	4			0		10	9	10		30	
Mean young per	5			٥	0	2	G	0		14	
	6			0	O	2	9	0		14	
30-1	7				10	0	14	14		7.8	
loo	8			7	7	0	15	14		36	
Survival:%	9			2	8	٥	i2	14		36	
	10	1	V	2	7	0	9	14		32	



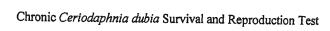
Chronic Ceriodaphnia dubia Survival and Reproduction Test

JRA# 11-08405

### OBSERVATIONS (cont.)

			N	UMBER OF Y	OUNG PRO	DUCED PER	DAY	· · · · · · · · · · · · · · · · · · ·			
CONC	REP	DAY I	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	TOTAL	T
12.5%	1	0	0	3	7	8	10	0		27	T
	2			2	0	11	11	0		24	
	3			0	10	0	B	18		41	
	4				O	2	14	10		26	
Mean young per	5				0	6	12	0		18	
29-0	-6				0	6	D	0		18	
21-	7			<b>√</b>	11	0	11	15		37	
1 = 5	8			0	10	0	6	14		30	
Survival:%	9			2	Ь	6	12	14		34	
<del></del>	10	4	V.	2	8	2	9	14		35	

			N	JMBER OF Y	OUNG PRO	DUCED PER	DAY				<del></del>
CONC	REP	DAY 1	DAY 2	DAY3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	TOTAL	T
25%		0	0	<u>a</u>	9	Ö	10	12		33	十一
	2			2	12	9	0	12		32	
	3			२	9	Ö.	3	13		27	
	4			2	7	0	LI.	12		32	
Mean young per	5			2	0	8	16	6		26	
	6			3	7	0	0	10		30	$\vdash$
28.8	7			2	9	Ó	W	12		32	
100	8			2	11	0	14	14		41	
Survival:%	9			2	5	0	0	11		18	
	10	V	V	g	7	1	12	0		21	





### OBSERVATIONS (cont.)

			N	UMBER OF Y	OUNG PRO	DUCED PER	DAY				<del>-</del>
CONC	REP	DAY I	DAY 2	DAY3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	TOTAL	
50%	1	0	0	J	10	(7	4	10		26	
	2	12		0	0	Ž	10	6		12	
	3			2	3	Ö	10	11		26	
	4			2	3	6	11	13		29	
Mean young per	5			2	0	10	12	0		24	
82	6			3	0	16	** []	0		24	
26.1	7			2	9	٦	Ö	14		32	
	8			0	10	0	9	14		33	
Survival:%	9			2	7	0	占	0		24	
	10		Y	ୟ	6	0	13	10		31	

			N	JMBER OF Y	OUNG PROI	DUCED PER	DAY	<del></del>			
CONC	REP	DAYI	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	TOTAL	
100%	1	0	0	2	9	0	8	11	(4) (4)	24	
	2			3	0	7	10	10		29	
	3			7	2	0	16	10		30	
	4			ન	4	0	16	14		36	
Mean young per	5			3	0	ष	16	0		38	
27-7	6			2	0	9	10	11		37	
	7			2	7	0	11	13		33	
leo	8			3	3	0	11	6		17	
Survival:%	9			3	5	0	10	13		31	
	10		4	3	3	Ó	il	0		רז	



Chronic Ceriodaphnia dubia Survival and Reproduction Test

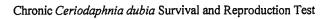
JRA# 11-08405

### PHYSICAL/CHEMICAL DATA

CONC: CONTROL		DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8
TEMP	NEW	24.4	248	24.3	2510	24.8	24.9	25.0	NIA	N/A
	END	N/A	245	145	25.0	254	25.0	2511	25.1	
рН	NEW	8.00	800	7.98	8.14	810	8.11	8.07	M4	N/A
	END	N/A	7-30	8.03	8.13	7.96	8.07	8.01	2.15	
DO	NEW	8.1	ક -ચે	8.4	8.1	8.1	8.2	8.2	NA	N/A
	END	N/A	3-3	8.3	8.4	8.2	812	8.1	8-3	
COND (µmhos	/cm)	179	179	179	179	179	181	184	24	N/A
DATE		6/14/11	6/15/4	6/16/1	6/17/11	6/18/11	6/19/11	6/20/11	601	
INITIALS		KY	دن	Ku	KU	KU	<i>kul</i>		C.pg	

CONC: 6.25%		DAY 0	DAYI	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8
ТЕМР	NEW	24.5	24.3	24.3	24.6	248	24.7	25.1	NA	N/A
	END	N/A	245	24.5	25-0	25.4	25.0	25.1	25-1	
рН	NEW	7.88	7.81	7.92	797	8.09	8.11	8.03	N/4	N/A
	END	N/A	757	8.01	8.01	7.90	8.00	7,88	8.02	
DO	NEW	8.2	8-3	8,4	8,3	8.2	8.3	8.2	W14	N/A
	END	N/A	8-3	8.1	8.2	8.1	8.0	8.2	8-2	
COND (µmhos	s/cm)	174	174	175	178	175	176	178	MA	N/A

CONC: 12.5%		DAY 0	DAYI	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8
TEMP	NEW	24.5	24.6	24.3	24.8	25.4	24.9	25.1	NA	N/A
	END	N/A	245	24.5	25.0	25.4	25.0	25.1	241	12
рН	NEW	7.80	7.71	7.84	7.91	8.06	8.07	8.03	2/4	N/A
	END	N/A	7-49	7.89	7.90	7.88	7.87	7.78	7.97	
DO	NEW	8.1	8-1	8,3	8.2	8.0	g. 1	8.3	M4	N/A
	END	N/A	8.3	8.1	8,2	8.0	8.0	8.1	3-2	
COND (µmho	s/cm)	172	171	[7]	174	171	171	174	NA	N/A





#### PHYSICAL/CHEMICAL DATA

111 DEO#:							NON O O		- 001	
CONC: 25%		DAY 0	DAY I	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8
TEMP	NEW	24.9	24.3	24.4	25.0	253	24.9	25.2	~k	N/A
	END	N/A	245	24.5	250	25.4	2510	25.1	25-1	
pН	NEW	7.67	7.60	7.66	7.81	7.91	7.99	7.95	NA	N/A
	END	N/A	7.40	7.83	7.80	7.81	7.80	7.71	7.9+	
DO	NEW	8.2	3.3	8.3	8.3	8.0	8.1	812	NA	N/A
	END	N/A	\$-7	8.2	8.1	8.0	7.8	8.1	ž	
COND (µmhos/c	m)	165	163	162	165	163	163	166	1A	N/A
DATE		6/14/11	6/14/1	6/16/11	blata	6/18/11	6/19/11	6 /20/11	6121	
INITIALS		KU	KH	KU	104	KY	<i>cu</i>	Ky	را)	843

CONC: 50%		DAY 0	DAY I	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8
TEMP	NEW	24.8	while	244	25.0	25.2	24.9	25.2	NA	N/A
	END	N/A	245	24.5	25.0	25,4	25.0	25.1	1-26	
рН	NEW	7.52	7.56	7.47	7.54	7-80	7.91	7.91	alt	N/A
	END	N/A	7.14	766	7.61	7.60	7.70	7.55	7.82	
DO	NEW	8.2	8.3	8.2	8.3	8.0	8.1	8.2	Ma	N/A
	END	N/A	8.7	8:1	8.1	8.0	7.9	8.0	2-1	
COND (µmhos/	cm)	146	147	145	148	146	147	149	MA	N/A

CONC: 100%		DAY 0	DAY I	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8
TEMP	NEW	25.2	25.6	25.7	24.9	25.2	24.7	25.5	M	N/A
	END	N/A	245	245	25.0	25.4	2500	25.	27-1	
рН	NEW	7.27	7,24	7.29	7.09	7.45	7.47	7.43	~14	N/A
	END	N/A	7.17	7.33	7.31	7.30	7.40	7.25	760	
DO	NEW	8.4	8-2	8.4	8.4	8.3	8.3	8.4	24	N/A
	END	N/A	8-1	7.9	8.0	7.8	7-8	7.9	8,0	
COND (µmho	s/cm)	110	(1)	1(3	113	114	112	115	NIA	N/A



### RANDOMIZATION TEMPLATE #1

NPDES#<u>VA0001872</u> CLIENT: <u>Fairfax Terminal Complex</u> OUTFALL: <u>001</u>

Concentration	Rep	Position #	Concentration	n Rep	Position #
Control	1 2 3 4	5 9 16 20	25%	1 2 3 4 5	2 8 18 23
	5 6 7	25 32 37		6 7	30 34 41
	8 9 10	44 53 58		8 9 10	48 54 60
6.25 %	1 2 3 4 5 6 7 8 9	1 7 15 19 28 36 42 45 50	50 %	1 2 3 4 5 6 7 8 9	3 11 13 24 29 31 38 46 51 59
12.5%	1 2 3 4 5 6 7 8 9	4 12 14 22 26 35 39 43 49 55	<u>100 %</u>	1 2 3 4 5 6 7 8 9	6 10 17 21 27 33 40 47 52 57



Chronic Ceriodaphnia dubia Survival and Reproduction Test

### WATER QUALITY

NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex_OUT	TFALL: 001_
--------------------------------------------------------	-------------

	SAMPLE (PRIOR TO RENEWALS)												
DATE	DAY	COLLECTION DATE/TIME	ARRIVAL DATE	TEMP (°C)	TINIT	FINAL pH (6 - 9)	INIT DO (mg/L)	FINAL DO (mg/L)	COND (µmhos)	INIT TRC (mg/L)	FINAL TRC (mg/L)	HARD (mg/L)	ALK (mg/L)
614/11	0	611311@ 1000 611311@ 0900	114/11	25.2	6.94	7.27	8.7	8.4	110	<b>∠</b> 0:02		27	19
6/15/11	-	6/13/4 @ 1075 6/14/11 @ 0935	11. ) .	25.6	6.83	7.24	9.7	8.2	113	40.02	1	27	3196
blala	2		• (	25.7	6.94	7.29	10.4	8.4	113	<0.02	1	27	38 cu
6/17/11	3	6/15/11 1030	6/17/11	24,9	7.9	\	8,4	,	113	८०.०2		28	25
6[18]111	4	• t	1.0	25.2			9.0	8,3	114	€0.07	. •	28	25
6/19/4	5	≋યુા	L,	24.7	6.93	7.47	9.8	8,3	112	20.02		28	25
6/20/11	6		` ` `	25.5	6.90		9.1	8.4	115	<0.02	~	46	25
	7												

DO Adjustments

Date 6/4/11 6/6/11 6/18/11 6/19/11 6/20/11

Method parula Aerate Aerate Derate Aerate perate

Minutes 10 20 25 15 20 10

_	DILUENT ( 20% DMW )											
DATE	DAY	DATE MADE	TEMP (°C)	pН	DO (mg/L)	COND (µmhos)	TRC (mg/L)	HARD (mg/L)	ALK (mg/L)			
6/14/11	0	6/10/11	24.4	8.00	8.1	179	20.02	Fo	63			
6/15/11	1	6(13/11	24.8	8,00	8,2	179	<0.02	81	61			
6/16/11	2	6/13/11	24.3	7.98	8.4	179	60.02	81	62			
6 (17/11	3	6/15/11	2500	8164	8.1	179	20.02	81	63			
6/18/11	4	6/15/11	24.8	8.10	8.1	179	20.02	81	63			
5/19/11	5	Blibles	24.9	8.11	8.2	181	20.02	So	63			
6/20/11	6	6117111	25.0	8.07	8.2	184	20.02	30	60			
	7											



### Chronic Ceriodaphnia dubia Survival and Reproduction Test

## Test JRA# 1/ - 08405 GENERAL COMMENTS

TRE	ATMENT PREPA	ARATIONS CAL	CULATIONS		VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC(%)	TOTAL VOLUME (mL)	STOCK CONC (%)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS	49	J. D.	4
Control	1200	N/A	0	1200	NUMBER OF ORGANISMS	4,		
6.25%	1200	100%	75	1125	REPRODUCTION CALCULATIONS	ربع ا		
12.5%	1200	100%	150	1050	STATISTICAL ANALYSES	4,		
25%	1200	100%	300	900	•			
50%	1200	100%	600	600			Cerin	len
100%	1200	100%	1200	0				
CALCULATIONS PERF	FORMED BY:							

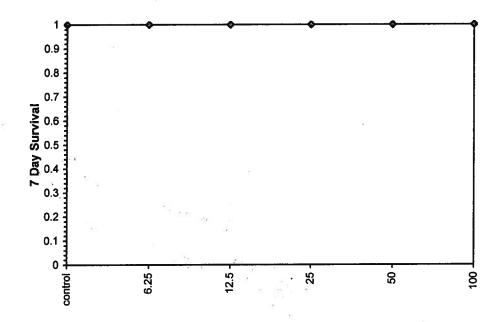
TEST CHAMBER SIZE: 30mL TYPE: polypropyler	VOLUME OF TEST SOLUTION	DN:15mL
SISTERS FROM: E99 E96 E9C E9	d Ege Egf Egg Egl	FRI FAI
	5 6 7	9 10
AGE OF ORGANISMS_hrs - Collected: Date 6 12411 From (	(time) 0830 - 1600	9 10
COMMENTS:	(inne) <u> </u>	
COMMENTS.		
	<u> </u>	
	<u> </u>	

			Cerioda	phnia Sui	rvival and	Reprod	uction Tes	t-7 Day	Survival			
Start Date:	6/14/2011		Test ID:	1108405c	d		Sample ID	):	1108405c	108405cd		
End Date:	6/21/2011		Lab ID:	Lab ID: JRR			Sample Ty	/pe:	DMR-Disc	harge Monitoring Report		
Sample Date:			Protocol:	EPAF 94-l	EPA/600/4	I-91/002	Test Spec	ies:	CD-Cerio	daphnia dubia		
Comments:												
Conc-%	1	2	3	4	5	6	7	8	9	10		
control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		
6.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		
12.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		
25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		
50	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		

				Not			Fisher's	1-Tailed	
Conc-%	Mean	N-Mean	Resp	Resp	Total	N	Exact P	Critical	
control	1.0000	1.0000	0	10	10	10	•		
6.25	1.0000	1.0000	0	10	10	10	1.0000	0.0500	
12.5	1.0000	1.0000	0	10	10	10	1.0000	0.0500	
25	1.0000	1.0000	0	10	10	10	1.0000	0.0500	
50	1.0000	1.0000	0	10	10	10	1.0000	0.0500	
100	1.0000		0	10	10	10	1.0000	0.0500	

Hypothesis Test (1-tail,	0.05)	NOEC	LOEC	ChV	TU	
Fisher's Exact Test	53	100	>1,00		1	
Treatments vs control			V			

Dose-Response Plot

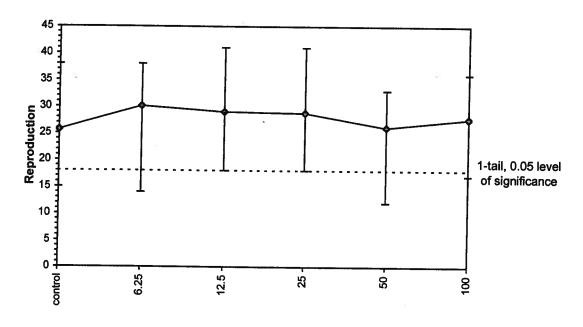


<u> </u>		Ceriodaphnia Survival and Reproduction Test-Reproduction													
Start Date:	6/14/2011		Test ID:	1108405c	d		Sample II		1108405cd						
End Date:	6/21/2011		Lab ID:	JRR			Sample T	уре:	DMR-Disc	harge Monitoring Repor					
Sample Date: Comments:		2.0	Protocol:	EPAF 94-	EPA/600/4	PA/600/4-91/002		Test Species:		CD-Ceriodaphnia dubia					
Conc-%	1	2	3	4	5	6	7	8	9	10					
control		20.000	38.000	15.000	17.000	17.000	36.000	30,000	25.000	28.000					
6.25	33.000	33.000	35.000	30.000	14.000	14.000	38,000	36.000		32.000					
12.5	27.000	24.000	41.000	26.000	18.000	18.000	37,000	30.000		35.000					
25	33.000	35.000	27.000	32.000	26.000	20,000	35.000	41.000		21.000					
50	26.000	12.000	26.000	29.000	24.000	24.000		33.000		31.000					
100	24.000	29.000	30.000	36.000	28.000	32.000		17.000	31.000	17.000					

_				Transform	n: Untran	sformed			1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	
control	25.700	1.0000	25.700	15.000	38.000	31.984	10				
6.25	30.100	1.1712	30.100	14.000	38.000	29.193	10	-1.304	2.287	7.718	
12.5	29.000	1.1284	29.000	18.000	41.000	26.956	10	-0.978	2.287	7.718	
25	28.800	1.1206	28.800	18.000	41.000	26.383	10	-0.918	2.287	7.718	
50	26.100	1.0156	26,100	12.000	33.000	23.091	10	-0.119	2.287	7.718 7.718	
100	27.700	1.0778	27.700	17.000	36.000	23.337	10	-0.593	2.287	7.718 7.718	

				Statistic		Critical		Skew	Kurt
mal distribu	rtion (p > 0	).05)		0.84971		0.895			-0.5062
iances (p =	0.89)			1.72873				0.001 4	0.0002
NOEC	LOEC	ChV	ΤU	MSDu	MSDp		MSE	F-Prob	df
100	>100		1	7.71766	0.3003				5, 54
V	V		V		V		22.3000	0., 0000	J, J4
	iances (p = NOEC	iances (p = 0.89) NOEC LOEC	NOEC LOEC ChV	iances (p = 0.89)  NOEC LOEC ChV TU	mal distribution (p > 0.05)       0.84971         iances (p = 0.89)       1.72873         NOEC LOEC ChV TU MSDu	mal distribution (p > 0.05)       0.84971         iances (p = 0.89)       1.72873         NOEC LOEC ChV TU MSDu MSDp	mal distribution (p > 0.05)       0.84971       0.895         iances (p = 0.89)       1.72873       15.0863         NOEC LOEC ChV       TU MSDu MSDp MSB	mal distribution (p > 0.05)       0.84971       0.895         iances (p = 0.89)       1.72873       15.0863         NOEC LOEC ChV       TU MSDu MSDp MSB MSE	mal distribution (p > 0.05)

**Dose-Response Plot** 

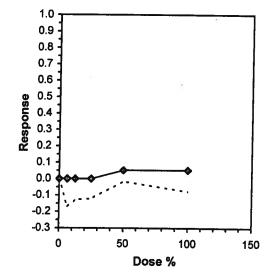


	8		Cerioda	aphnia Su	rvival and	Reproc	luction Te	st-Repro	duction		
Start Date: End Date: Sample Date: Comments:	6/14/2011 6/21/2011		Test ID: Lab ID:	1108405c JRR	d				1108405cd DMR-Discharge Monitoring Repo CD-Ceriodaphnia dubia		
Conc-%	1	2	3	4	5	6	7	8	9	10	······································
control	31.000	20.000	38.000	15.000	17.000	17.000	36,000	30.000	25.000	28,000	<del></del>
6.25	33.000	33.000	35.000	30.000	14.000	14.000	38.000	36.000		32.000	
12.5	27.000	24.000	41.000	26.000	18.000	18.000	37.000	30.000		35.000	
25	33.000	35.000	27.000	32.000	26.000	20.000		41.000	•••	21.000	
50	26.000	12.000	26.000	29.000	24.000	24.000		33.000		31.000	
100	24.000	29.000	30.000	36.000	28.000	32.000	33.000	17.000	31.000	17.000	

_		<u>Transforr</u>	n: Untran	sformed		Isotonic		
Mean N-Mean	Mean	Min	Max	CV%	N	Mean N-Mean		
25.700 🗸 1.0000	25.700	15.000	38.000	31.984	10	28.400 1.0000		
30.100 🗸 1.1712	30.100	14.000	38.000	29.193	· <del>-</del>	28.400 1.0000		
29.000 🗸 1.1284	29.000	18.000	41,000	26.956		28,400 1,0000		
28.800 × 1.1206	28.800	18.000	41.000	26.383				
26.100 1.0156	26.100							
27.700 V 1.0778	27.700	17.000			· <del>-</del>	26.900 0.9472 26.900 0.9472		
	30.100 \( \sigma \) 1.1712 29.000 \( \sigma \) 1.1284 28.800 \( \sigma \) 1.1206 26.100 \( \sigma \) 1.0156	25.700 \( \) 1.0000 \( \) 25.700 \( \) 30.100 \( \) 1.1712 \( \) 30.100 \( \) 29.000 \( \) 1.1284 \( \) 29.000 \( \) 28.800 \( \) 1.1206 \( \) 28.800 \( \) 26.100 \( \) 1.0156 \( \) 26.100	Mean         N-Mean         Mean         Min           25.700 ✓ 1.0000         25.700         15.000           30.100 ✓ 1.1712         30.100         14.000           29.000 ✓ 1.1284         29.000         18.000           28.800 ✓ 1.1206         28.800         18.000           26.100 ✓ 1.0156         26.100         12.000	Mean         N-Mean         Mean         Min         Max           25.700 ✓ 1.0000         25.700         15.000         38.000           30.100 ✓ 1.1712         30.100         14.000         38.000           29.000 ✓ 1.1284         29.000         18.000         41.000           28.800 ✓ 1.1206         28.800         18.000         41.000           26.100 ✓ 1.0156         26.100         12.000         33.000	25.700 \$\sqrtex\$ 1.0000	Mean         N-Mean         Mean         Min         Max         CV%         N           25.700 ✓ 1.0000         25.700         15.000         38.000         31.984         10           30.100 ✓ 1.1712         30.100         14.000         38.000         29.193         10           29.000 ✓ 1.1284         29.000         18.000         41.000         26.956         10           28.800 ✓ 1.1206         28.800         18.000         41.000         26.383         10           26.100 ✓ 1.0156         26.100         12.000         33.000         23.091         10		

Auxiliary Tests	Statistic	Critical	Skew Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.84971	0.895	-0.5074 -0.5062
Bartlett's Test indicates equal variances (p = 0.89)	1.72873	15.0863	3,330

| Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | Column | C



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: End Date:

6/14/2011

6/21/2011

Test ID: 1108405cd

Sample ID:

1108405cd

Lab ID: JRR

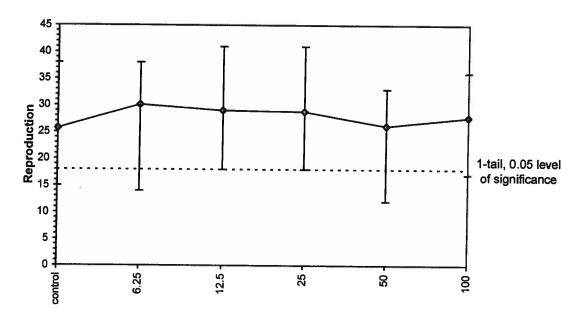
Sample Type:

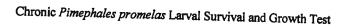
Sample Date: Comments:

Protocol: EPAF 94-EPA/600/4-91/002 Test Species:

DMR-Discharge Monitoring Report CD-Ceriodaphnia dubia

Dose-Response Plot







### PHYSICAL/CHEMICAL DATA

CONC: Control					T COMP.	ICX OOI	FALL: O	UIFALL	<i>.</i> : 001
	<del>1</del>	DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24.4	24.8	24.3	25,0	24.8	24.9	25.0	N/A
	END	N/A	24.5	24.5	24,5	24.5	245	24.5	24.5
рН	NEW	8.00	800	7.98	8.14	8.10		8.07	N/A
	END	N/A	7.32	7,21	7.40	7.55	7.40	7.56	7.43
DO (mg/L)	NEW	8.1	8,2	8.4	8.1	8.1	8.2	8.2	N/A
	END	N/A	6.8	5.9	6.2	6.7	6.0	6.8	6.5
COND (µmhos/cm	)	179	179	179	179	179	181	184	N/A
DATE		6/14/11	blisty	6/6/11	61,71.1		6/19/10	6/20/11	6/21/1
INITIALS		KU	ru	Ku	KU	10cm	RU	164	612111 Eu

CONC: 6.25%		DAY 0	DAY I	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	Davis
TEMP (°C)	NEW	24.5	243	243	24.6	24.8	24.7	25.1	DAY 7
	END	N/A	24.5	24.5	24.5	24.5	24.5	24.5	24.5
pН	NEW	7.88	7.81	7.92	7.97	8.09	8.11	8.03	N/A
	END	N/A	7.08	7.16	7.25	7-32	7-21	7.28	7.26
DO (mg/L)	NEW	8.2	8.3	8.4	8.3	8.2	8.3	8.2	N/A
	END	N/A	6-2	5.9	5.8	6.1	5.7	5.9	0.2
COND (µmhos	/cm)	174	174	175	178	175	176	178	N/A

	DAY 0	DAY 1	DAY 2	DAY 3	DAY4	DAY 5	DAV 6	DAYS
NEW	24.5	24.6	243	248	25.4	<del> </del>	<del>                                     </del>	DAY 7
END	N/A	24.5	24.5	24.5	24.5	24.5		24.5
NEW	7.80	7.71	7.84	7.91	8.06	8.07	8,03	N/A
<del> </del>			7.08	7.30	7.29	7.16	7.20	7.15
			<del></del>	8.2	8.0	8.1	8.3	N/A
		5.8	5.9	6.1	6.1	5.9	5.7	5.7
	END	NEW         24.5           END         N/A           NEW         7.80           END         N/A           NEW         8.1           END         N/A	NEW 24.5 24.6  END N/A 24.5  NEW 7.80 7.71  END N/A 6.92  NEW 8.1 8.1  END N/A 5.8	NEW         24.5         24.6         24.3           END         N/A         24.5         24.5           NEW         7.80         7.71         7.84           END         N/A         6.92         7.68           NEW         8.1         8.3         8.3           END         N/A         5.8         5.9	NEW         24.5         24.6         24.3         24.8           END         N/A         24.5         24.5         24.5           NEW         7.80         7.71         7.84         7.91           END         N/A         6.92         7.08         7.30           NEW         8.1         8.3         8.2           END         N/A         5.8         5.9         6.1	NEW         24.5         24.6         24.3         24.8         25.4           END         N/A         24.5         24.5         24.5         24.5         24.5         24.5           NEW         7.80         7.71         7.84         7.91         8.06         8.06           END         N/A         6.92         7.08         7.30         7.29           NEW         8.1         8.3         8.2         8.0           END         N/A         5.8         5.9         6.1         6.1	NEW         24.5         24.6         24.3         24.8         25.4         24.9           END         N/A         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5<	NEW 24.5 24.6 24.3 24.8 25.4 24.9 25.1 END N/A 24.5 24.5 24.5 24.5 24.5 24.5 24.5 24.5





### PHYSICAL/CHEMICAL DATA

CONC: 25%						1	1		
	<del></del>	DAY 0	DAY 1	DAY 2	DAY 3	DAY4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24.9	24.3	24,4	25,0	25.3	24.9	25.2	N/A
	END	N/A	24.5	245	245	24.5	24.5	24.5	245
рН	NEW	7.67	7.60	7.66	7.81	7.91	7.99	7.95	N/A
	END	N/A	6.79	7.03	7,17	7.17	7.02	7.18	7.09
DO (mg/L)	NEW	8.2	8,3	8.3	8.3	8.0	8.1	8.2	N/A
	END	N/A	5.7	5.6	6.0	6.0	5.9	6.4	5.6
COND (µmhos/cm	)	165	163	162	165	163	163	166	N/A
DATE		$\ell  \psi _{11}$		6/16/11	6/17/11	6/18/11	6/19/11	6/20/11	6/21/11
INITIALS		1cu	KH	104	ru	1CU	icu	Ky	Ku

CONC: 50%		DAY 0	DAY I	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24.8	24.6	24.4	25.0	25.2	24.9	25.2	N/A
·	END	N/A	24.5	24,5	24.5	24.5	24.5	24.5	24.5
pН	NEW	7.52	7.56	7.47	7.54	7.80	7.91	7.91	N/A
	END	N/A	6.68	6.88	7.07	7.05	6.90	7.02	6.99
DO (mg/L)	NEW	8,2	8.3	8.2	8.3	8.0	8.1	8.2	N/A
····	END	N/A	5.9	5.6	5.8	6.1	5.7	5.6	5.5
COND (µmhos	/cm)	146	147	145	148	146	147	149	N/A

CONC: 100%		DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	25.2	25.6	25.7	24.9	25.2	24.7	25.5	N/A
	END	N/A	24.5	24.5	245	24.5	24.5	24.5	24.5
pН	NEW	7.27	7.24	7.29	7.09	7.45	7.47	7.43	N/A
<del></del>	END	N/A	6.35	6 64	6.72	6.81	6.70	6.75	6.72
DO (mg/L)	NEW	8.4	8.2	8.4	8.4	8.3	8.3	8.4	N/A
	END	N/A	5.9	5.5	5.7	6.1	6.0	6.8	5.9
COND (µmhos	/cm)	110	113	113	113	114	112	115	N/A



## Chronic Pimephales promelas Larval Survival and Growth Test

### th Test JRA# 1; -08405 GENERAL COMMENTS

NPDES#: VA	PDES#: VA0001872 CLIENT: Fairfax Terminal Complex									
FEEDINGS	DAY 0	DAY I	DAY 2	DAY 3	DAY 4		JTFALL: 001			
DATE/TIME		830	6/16/11	6/17/11	6/08/11	DAY 5	DAY 6			
INITIALS		KU	Ku	KU	104	736	830			
DATE/TIME	1500	1215	61:61:1	6/17/11	6/18/11	6119111	6/2011			
INITIALS	1001	Ku	ku	KH	KU	1315	1330			

	TREATMENT PREPARATIONS CALCULATIONS								ANALYST SIGNATURES	INITIALS
Conc. (%) (circle one)	Total Volume (mL)	Stock Conc. (%)	Amount Stock (mL)	Amount Diluent (mL)	Hard (mg/L)	ALK (mg/L)	Treatment Preparation Calculations	Lo	1-42	٠,٠
Control	1200	N/A	0	1200	30-81	60-63		4		
6.25%	1200	100%	75	1125			Statistical			
12.5%	1200	100%	150	1050			Analyses	4		
25%	1200	100%	300	900			Analyses			
50%	1200	100%	600	600						
100%	1200	100%	1200		27-28	19-21			Celly	ier
Stock Solution					7			l	**	<i>-</i> -1

TEST CHAMBER SIZE: 500mL	TYPE:	Polystyrene	VOLUME OF TEST SOLUTION: 250mL
COMMENTS:			

Chronic Pimephales promelas Larval Survival and Growth Test

JRA# 11-08405

### WATER QUALITY

	SAMPLE (PRIOR TO RENEWALS)											<del></del>	
DATE	DAY	COLLECTION DATE/TIME	ARRIVAL DATE	TEMP (°C)	INIT pH	FINAL pH (6 - 9)	INIT DO (mg/L)	FINAL DO (mg/L)	COND (µmhos)	INIT TRC (mg/L)	FINAL TRC (mg/L)	HARD (mg/L)	ALK (mg/L)
6/4/11	0	6/13/110000		25.2	6.94	7-27	8.7	8.4	110	(0.0)		27	19
6115111		6/13/11 1035	6/15/11	25.6	6.83		9.7	8.2	113	€3.5)	-	27	25
6/16/11	3	6115/11/039	(1)	257	694	7.29		8.4	113	20.0	<u> </u>	27	32
6117/11		6/16/11 0930	6/7/11	24.9	7.09		8,4		113	6.02		28	2.7
6/18/11		- 11					9.0	8.3	114	<0.02	,	മു	25
6/19/11	5	- "	_ 4		6.93	7.47	9.8	8.3	112	<0.02	1	28	25
6/20/1	6	**		25.5	6.90	7.43	9.1	8.4	115	20.02	-	28	25

DO Adjustments	Date Method Minutes	6/14/11 6/15/11 6/16/11 6/18/11 6/19/11 6/20/11 14-10 20 25 10 20 10
pH Adjustments	Date Method Amount	
TRC Adjustments	Date Method Amount	

		DILUENT (OMW)	Mod Hard SFW	Other		) CI	RCLE ONE		
DATE	DAY	DATE MADE	TEMP (°C)	pН	DO (mg/L)	COND (µmhos)	TRC (mg/L)	HARD (mg/L)	ALK (mg/L)
6/14/11	0	6/10/11	24.4	8.00	8.1	179	<0.02	fo	63
6/15/11	1	6/13/11	24.8	8.00	8.2	179	20.02	81	62
6 (16/11	2	6/13/1)	24.3	7.98	8,4	179	<0.02	81	64
6/17/11	3	6(15/11	2500	8114	8.1	179	20.02	81	63
\$18/11	4	6(15/11	24,8	8.10	8.1	179	€0002		63
6/19/11	5	6/16/11	24.9	841	8.2	181	20.0	•	63
6/20/11	6	6617/11	25.0	8.07	8.2	184	20102	80	60





### **OBSERVATIONS**

NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001

6/12/11 @

ORGANISM S	OURC	E: Chesar	oeake Cul	tures JF	RA BATO	CH #: P9	03	HATCH	DATE:
			N	UMBER SUR	VIVING/DAY				Dilli.
CONC	RE	P DA	Y 0 DAY	1 DAY	Y 2 DAY	73 DAY	Y4 DAY	Y 5 DAY	Y6 DA
Control			10	io	ic	7 10	) 10	10	f
Control	В		10	10	10	10	) (0	0 10	10
- 106	c	10	10	10	10	10	10	10	10
X suv 106_%	D	10	10	10	10	10	10	63	10
6.25%		10	10	10	10	10	10	10	10
0.2376	В	10	10	10	10	10	10	10	10
= Q7C	C	10	10	9	9	9	9	9	9
x suv <u>975</u> %	D	10	10	10	10	10	10	(0	10
12.5%	A	10	10	10	10	10	10	10	10
4.376	В	10	10	10	10	10	10	(0	10
x suv_100_%	- c	10	10	(0	10	10	10	10	10
X suv%	D	10	10	10	10	10	10	10	10
5%	A	10	10	10	10	10	10	10	10
J76	B	10	10	10	10	10	10	10	10
k suv_100 %	c	10	10	10	[0	10	10	10	10
Suv_too_%	D	10	10	10	10	10	(0	10	10
	A	10	10	io	10	10	10	10	10
,	В	10	10	10	9	9	9	9	9
% suv_975%	С	10	10	(0	10	10	10	10	10
suv%	D ,	10	10	10	10	10	lo	10	10
%	<u>A</u>	10	10	10	10	10	10	10	10
70	В	10	io	10	10	10	9	10	10
100	С	10	10	10	10	10	(0	10	10
suv_100_%	D	10	10	10	10	10	[0	10	(0
DATE		611411)	6/15/11	Girdu	6/17/11	6/18/11	6/19/11	6/20/11	
TIME		1130	1130		1050	1045		1000	1040
TINIT		Ku	M	راع	ice	KU	Ku	ku	Ku

### **Chronic P.promelas Survival and Growth Test**

NPDS# VA0001872 CLIENT: Fairfax Terminal Complex **GROWTH DATA** 

OUTFALL# 001

JRA:

11-08405

FOIL WT(mg) CONC. REP FOIL# FOIL WT&ORG WT(mg) WT OF ORGS(mg) #ORGS MEAN 1H 4.303 14.707 10.404 1.040 10 В 2H 5.187 14.797 9.610 10 0.961 Control C 15.644 3H 5.689 9.955 10 0.996 Ave. wt of surviving 5.908 4H 15.858 9.95 10 0.995 Control:(mg) 0.998 ave. wt: 0.998 5H 5.276 14.482 9.206 0.921 10 В 6H 5.804 15.223 9.419 10 0.942 6.25% C 7H 5.416 7.473 0.747 12.889 10 H8 6.065 15.760 9.695 10 0.970 ave. wt: 0.895 9H 6.059 14.610 8.551 10 0.855 В 10H 6.517 14.843 8.326 <u>10</u> 0.833 12.5% 11H 7.336 16.805 9.469 10 0.947 12H 6.852 16.420 9.568 10 0.957 0.898 lave. wt: 13H 6.826 16.468 9.642 0.964 10 В 14H 6.333 15.862 9.529 <u>10</u> 0.953 25% C 15H 6.458 16.882 10.424 10 1.042 16H D 6.88 16.481 9.601 10 0.960 0.980 ave. wt: Α 17H 5.809 14.845 9.036 10 0.904 18H 6.581 14.717 0.814 В 8.136 10 50% C 19H 6.649 16.214 9.565 10 0.957 20H D 6.882 16.433 9.551 0.955 ave. wt: 0.907 21H 6.034 15.373 9.339 10 0.934 В 22H 6.687 15.754 9.067 10 0.907 100% C 23H 6.601 16.283 9.682 10 0.968 24H 6.723 16.298 9.575 10 0.958 0.942 ave. wt: 6/17/2011 Date 6/22/2011 Intials LD LD

Date/Time i	n Oven	6/21/11@1145_	Analyst	KH
Date/Time of	out of Oven	6/22/11@0830	Analyst	KH

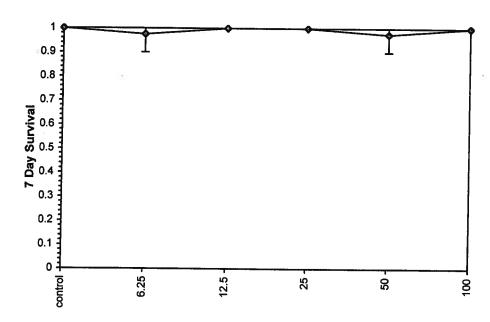
Oven Temp<sup>0</sup>C\_\_\_\_\_105\_\_\_\_\_ Oven Temp<sup>0</sup>C\_\_\_\_\_105

			La	rval Fish Gro	wth and Surviv	al Test-7 Day Su	ırvival
Start Date: End Date: Sample Date: Comments:	6/14/2011 6/21/2011		Test ID: Lab ID:	11-08405fh JRR	4/600/4-91/002	Sample ID: Sample Type:	11-08405fh DMR-Discharge Monitoring Report PP-Pimephales promelas
Conc-%	1	2	3	4			
control	1.0000	1.0000	1.0000	1.0000	<del></del>	The state of the s	
6.25	1.0000	1.0000	0.9000	1.0000			
12.5	1.0000	1.0000	1.0000	1.0000			
25	1.0000	1.0000	1.0000	1.0000			
50	1.0000	0.9000	1.0000	1.0000			
100	1.0000	1.0000	1.0000	1.0000			

			Tr	ansform:	Arcsin Sc	uare Roo	Rank	1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	
control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4			
6.25	0.9750	0.9750	1.3713	1.2490	1.4120	5.942	4	16.00	10.00	
12.5	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00	
25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00	
50	0.9750	0.9750	1.3713	1.2490	1.4120	5.942	4	16.00	10.00	
100	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00	

Auxiliary Tests					Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates nor	n-normal dis	stribution		0.61382	0.916		5.27706	
Equality of variance cannot be co			,			0.0.0	2.1000	3.27700
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	ΤU		F	6	
Steel's Many-One Rank Test	100	>100		1				
Treatments vs control				-				

### Dose-Response Plot

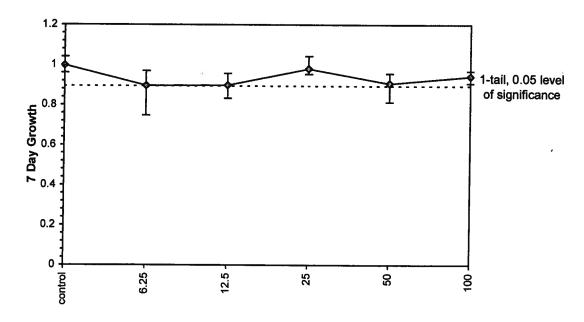


		0	La	rval Fish Growth and Survi	val Test-7 Day G	rowth
Start Date: End Date: Sample Date: Comments:	6/14/2011 6/21/2011		Test ID: Lab ID:	11-08405fh JRR EPAF 94-EPA/600/4-91/002	Sample ID: Sample Type:	11 DMR-Discharge Monitoring Report PP-Pimephales promelas
Conc-%	1	2	3	4		
control	1.0404	0.9610	0.9955	0.9950		
6.25	0.9206	0.9419	0.7473	0.9695		
12.5	0.8551	0.8326	0.9469	0.9568		
25	0.9642	0.9529	1.0424	0.9601		
50	0.9036	0.8136	0.9565	0.9551		
100	0.9339	0.9067	0.9682	0.9575		

	_		Transform	n: Untran	sformed		1-Tailed		
Conc-%	Mean N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
control	0.9980 1.0000	0.9980	0.9610	1.0404	3.263	4			
6.25	0.8948 🗸 0.8966	0.8948	0.7473	0.9695	11.216	4	2.402	2.410	0.1035
12.5	0.8979 r 0.8997	0.8979	0.8326	0.9568	7.034	4	2.332	2,410	0.1035
25	0.9799 🗸 0.9819	0.9799	0.9529	1.0424	4.279	4	0.421	2.410	0.1035
50	0.9072 ≥ 0.9090	0.9072	0.8136	0.9565	7.394	4	2.114	2.410	0.1035
100	0.9416 🗸 0.9435	0.9416	0.9067	0.9682	2.901	4	1.313	2.410	0.1035

Auxiliary Tests					Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates nor	mal distribu	ition (p > (	0.05)		0.93266		0.916			1.04276
Bartlett's Test indicates equal var		6.11568		15.0863						
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.10349	0.1037	0.00782	0.00369	0.10965	5. 18
Treatments vs control		~				V				٥, .٠

Dose-Response Plot

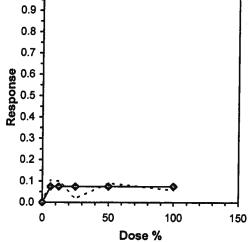


			La	rval Fish Growth and Survi	val Test-7 Day G	rowth
Start Date:	6/14/2011		Test ID:	11-08405fh	Sample ID:	11
End Date:	6/21/2011		Lab ID:	JRR	Sample Type:	DMR-Discharge Monitoring Report
Sample Date:			Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	PP-Pimephales promelas
Comments:						
Conc-%	1	2	3	4		
control	1.0404	0.9610	0.9955	0.9950		
6.25	0.9206	0.9419	0.7473	0.9695		
12.5	0.8551	0.8326	0.9469	0.9568		
25	0.9642	0.9529	1.0424	0.9601		
50	0.9036	0.8136	0.9565	0.9551	100	
100	0.9339	0.9067	0.9682	0.9575		

	Transform: Untransformed						Cons 9/ Mass	Isotonic
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean N-Mean
control	0.9980	1.0000	0.9980	0.9610	1.0404	3.263	4	0.9980 1.0000
6.25	0.8948	0.8966	0.8948	0.7473	0.9695	11.216	4	0.9243 0.9261
12.5	0.8979	0.8997	0.8979	0.8326	0.9568	7.034	4	0.9243 0.9261
25	0.9799	0.9819	0.9799	0.9529	1.0424	4.279	4	0.9243 0.9261
50	0.9072	0.9090	0.9072	0.8136	0.9565	7.394	4	0.9243 0.9261
100	0.9416	0.9435	0.9416	0.9067	0.9682	2.901	4	0.9243 0.9261

Auxiliary Tests	Statistic	Critical	Skew Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.93266	0.916	-0.9415 1.04276
Bartlett's Test indicates equal variances (p = 0.30)	6.11568	15.0863	

Linear Interpolation (200 Resamples) Point IC05\* Skew SD 95% CL(Exp) 4.2313 >100 >100 IC10 IC15 1.0 IC20 >100 0.9 IC25 VIC40 >100 ¥ >100 8.0 IC50 >100 0.7 \* indicates IC estimate less than the lowest concentration



Larval Fish Growth and Survival Test-7 Day Growth

Start Date: End Date:

6/14/2011

6/21/2011

Test ID: 11-08405fh

Sample ID:

11

**DMR-Discharge Monitoring Report** 

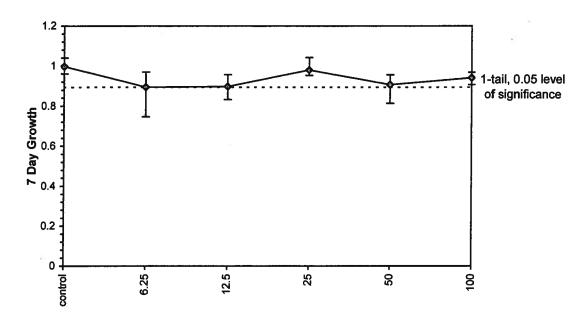
Sample Date: Comments:

Lab ID: JRR Protocol: EPAF 94-EPA/600/4-91/002 Test Species:

Sample Type:

PP-Pimephales promelas

Dose-Response Plot







# Toxicity Test Sample Chain of Custody PLEASE COMPLETE ALL INFORMATION Facility: Fairfay Terminal JB(

Facility: Fair fax Terminal USC	
NPDES#: <u>VA 0001872</u>	
Address: 9001 colonial Ave, Fairfax VA 22031	
County: Fairtax Pipe/Outfall/Location: PS-00	
Flow Type (Circle One): Continuous Intermittent Batch Stormwater Other:	
Instream Waste Conc	
Type of sample:	
(Grab): Date Time Amount of Sample Collected	
(Time Composite): Collected from (Date/Time): $\frac{\omega}{12/11} / 1000$	
To (Date/Time): <u><i>ω/١</i>3///</u> / 0900	
Number/Volume of Subsamples: 24 Time Increment: 1 hv. Total Amount Collected: 590	1
(Flow-Proportional Composite: ): Collected from (Date/Time):	
To (Date/Time):	
Set Volume Subsample/Volume Flow: Total Amount Collected:	
For variable volume subsamples based on flow/set time Increments Attach sample and flow information.	
Sample collected by: (print) Lyndsay Pierce, Affiliation: WLS	
(sign) Josephi	
*Temperature of sample in sample collection device	
*Final temperature of effluent at sample collection point 210.40C	
*Is sample collection device chilled? <u>Ves</u> Is sample packed on ice for shipment? <u>Ves</u>	
*It is required that all samples remain at 0-6°C during collection period and shipment for data to be accepted	d
by the appropriate Regulatory Agency (Do not freeze!)	
Is the sample chlorinated? dechlorinated? If so,how?	
Permit with interim chlorine limit? No If yes-limit (mg/L)	
Field pH 6.77 Field Total Residual Chlorine O. Comg/L Time: 0930 Grab time: 0930	
Name of Analyst: Lindsay Pierre Affiliation: URS.	
Comments/Sample description Waste Water / Starm Water	
Method of Shipment: Fed EX	
Shipment Date / Time: (a/13/11 / 1300)	
Type of test(s) to be performed: Chronic C. dubia	
(Specify organisms): Chronic P. Promelas	
PRINT & SIGN NAMES	
Relinquished by: (Print) <u>Undsay Pierce</u> /Sign food Str. Date/Time 6/13/11/130 Received by: (Print) Fed Str. /Sign Date/Time	20
Received by: (Print ) Fed /Sign Date/Time	
Relinquished by: (Print) FedEv /Sign Date/Time	}
Received by: (Print_) Khandi Johnson /Sign_VCDate/Time_6-14-11_0928	
	_
Relinquished by: (Print)/SignDate/Time	
Received by: (Print ) /Sign Date/Time	
	_
EFFLUENT CONDITION UPON ARRIVAL AT LABORATORY	
IRA #: 11 - 08405A Arrival Temperature: 3.1℃ Date: 6-14-11 Time: 0928 Ice Present (Yes)/	
Sample Volume: 2.5 Guy Color: Light brow Odor: None Solids: Some pH: 6.94 DO (mg/L): 8.	71
Conductivity (µmhos/cm) 110 ku 11 @ 25.2 °C Salinity (ppt ): _ < 1 TRC (mg/L): _ < 0.0 Z Method (For TRC): HACH 8167 Analyst: Lu	
Method (For TRC): HACH 8167 Analyst:	





# Toxicity Test Sample Chain of Custody PLEASE COMPLETE ALL INFORMATION Facility: Falvfax Terminal JBC

Facility: Falviax levininal JBC	
NPDES#: <u>VAOOD 1872</u>	
Address: 9601 coloniai Ave, Fairfax VA 22031	
County: Pay Pipe/Outfall/Location: PS-001	
Flow Type (Circle One): Continuous Intermittent Batch Stormwater Other:	•
Instream Waste Conc	•
Type of sample:	
(Grab): Date Time Amount of Sample Collected	
(Time Composite): Collected from (Date/Time): 6/13/11 / 1035	
To (Date/Time): 10/14/11 / 0022 S	
Number/Volume of Subsamples: 24 Time Increment: 1 hr. Total Amount Collected:	5001
(Flow-Proportional Composite: ): Collected from (Date/Time):	<del>2 9 2</del> 2
To (Date/Time):	
Set Volume Subsample/Volume Flow: Total Amount Collected:	
For variable volume subsamples based on flow/set time Increments Attach sample and flow information.	
Sample collected by: (print) LINGSOU PIEVILE Affiliation: URS	
(sign) Josep (1)	-
*Temperature of sample in sample collection device 3.7°C	
*Final temperature of effluent at sample collection point 25.9°C	
*Is sample collection device chilled? $\ensuremath{\slashed}$ Is sample packed on ice for shipment? $\ensuremath{\slashed}$ $\ensuremath{\slashed}$	
*It is required that all samples remain at 0-6°C during collection period and shipment for data to be a	noontod
by the appropriate Regulatory Agency (Do not freeze!)	rcepteu
Is the sample chlorinated? $\sqrt{o}$ dechlorinated? $\sqrt{o}$ If so,how?	
Permit with interim chlorine limit? If yes- limit (mg/L)	<del></del>
Field pH 6.38 Field Total Residual Chlorine 0.00mg/L Time: 0940 Grab time: 0940	
Name of Analyst: Und Sau Pierre Affiliation: URS	
Comments/Sample description Wasternater /Starm Water	
Method of Shipment: Fed EX	
Shipment Date / Time: 6/14/11 / 1400	
Type of test(s) to be performed: Chronic C. dubia	
(Specify organisms): Chronic P. Orometas	
(specify organisms). Character to prometa 5	
PRINT & SIGN NAMES	
· · · · · · · · · · · · · · · · · · ·	11100
Relinquished by: (Print)   Ind Say Pleve / Sign   Date/Time   O/14/11   Received by: (Print )   FedEx   / Sign   Date/Time   O/14/11	1400
Received by: (Print_) FedE / /Sign_ / Date/Time	<del></del>
Palinguighed by: (Print) to dC.	MID
Relinquished by: (Print) FedEx /Sign Date/Time G-15-11  Received by: (Print) Khandi Johnson /Sign Date/Time G-15-11	0112
Received by: (Print_) Khandi Johnson /Sign Received by: (Print_) Kha	2712
Delin midded for Original (C)	
Relinquished by: (Print) /Sign Date/Time	
Received by: (Print_)/SignDate/Time	
11-08405 B EFFLUENT CONDITION UPON ARRIVAL AT LABORATORY	
	Vad / Na
JRA #: H-08480. Arrival Temperature: O.S. Date: 6-15-11 Time: 08 0912 Ice Present: Sample Volume: 2.56a1 Color: Light bro Odor: None Solids: Some pH: 6.83 DO (mg/L)	169/10
Conductivity (µmhos/cm) 1/3 @ 25.6 °C Salinity (ppt):   TRC (mg/L): _< 25.6 °C Salinity (ppt): 21.6 °C Salinity (ppt):	· <u> </u>
Method (For TRC): HACH 8167 Analyst:	

### #2 Coolers for this shipment. Toxicity Test Sample Chain of Custody



1 UXICIL	y Test Sample C		Justuay		
773 - 111.	PLEASE COMPLETE ALL IN			(3)	
Facility:	Fairfax Terminal	100			
NPDES#:	VA 0001872	Falletan	111/ 4202		
Address:	9601 Colonial Ave	, rairtax	VA 2205 1	57 501	
County:	Falv-fax Circle One): Continuous Int	Pipe/	Outfall/Location: _	•	
				Other:	<del></del>
	ste Conc			-	
Type of samp	ple:			1. 0.11	
			Amount of Sam		
<u>√</u> (Tim	e Composite): Collected from	m (Date/Time):	6/15/11/	1030	
	To (Date/Tinber/Volume of Subsamples:	ne): <u>(0 / 1   0</u>	/11 / 0930'		3 1
Nun	ber/Volume of Subsamples:	2+	ime increment:	Total Amount Collec	ted: <u>5 ga</u> l
(Flov	v-Proportional Composite: ):	Collected from	n (Date/Time):		<u> </u>
			Date/Time):		_
Set	Volume Subsample/Volume	Flow:		Amount Collected:	
	volume subsamples based on				on.
Sample collection	cted by: (print) HASQU		Affiliation:	UZ >	
	(sign) Josey J				
	of sample in sample collecti				
*Final temper	ature of effluent at sample co	ollection point _	24.1°C		
*Is sample col	llection device chilled? \	S Is sample	packed on ice for s	shipment? $\langle E \rangle$	_
	d that all samples remain a	(i) —	<del>-</del>	and shipment for data to	oe accepted
by the appro	opriate Regulatory Agency	(Do not freeze	e!)		
	chlorinated? <u>No</u> dechlo				
	terim chlorine limit?				-
Field pH 6.3	Field Total Residual Ch	llorine <u>0.00mg/</u>	L Time: <u>09 S</u>	Grab time: $0980$	<u>!</u>
	yst: Undsay Pier				_
	mple description J Wasta		storm water	· · · · · · · · · · · · · · · · · · ·	<del>_</del>
Method of Shi	pment: <u>tedtv</u>	1 - 3			
Shipment Date	e/Time: 10/10/11/	500	- 1-V >		3
Type of test(s)	to be performed: VIVOY	110 00			
(Sp	pecify organisms): <u>Chyw</u>	116 P.	promeia s		
PRINT & SIG	3N NAMES	) A = 000	11-1	D . m: ( ) ( )	1. 1
	oy: (Print) Lind Say F		Joseph Xr	Date/Time U/16 Date/Time	<u>/11 /15</u> 00
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	by: (Print) FedEx	/Sign		Date/Time	
Received by: (	Print \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	/Sign_	Chandi Johnso	Date/Time (0-17	-11 0915
	<i>y</i>				
Relinquished b	• • • • • • • • • • • • • • • • • • • •	/Sign		Date/Time	
Received by: (1	Print_)	/Sign		Date/Time	
	EFFLUENT CON	THE STATE OF THE S	NI ADDIVIAL ATI	LADODATODV	
TD A #. 1\- A	8405C Arrival Temperatur				sent: Yes/No
Somela Value	e: 2.5 Gal Color: Light	Me of Odor M	a Solida C	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	ng/L): <b>8.4</b>
• "	umhos/cm) (13 @			TRC (mg/L): <b>&lt; o</b> .	0 2
Method (For I)	RC): <u>HACH 8167</u>	Analyst:	<u> </u>		



4 June 2012

**SENT BY FEDEX** 

Compliance Auditor
The Department of Environmental Quality
Northern Regional Office
13901 Crown Court
Woodbridge, VA 22193

RE: VPDES Permit Number VA0001872

Fairfax Terminal Complex Fairfax, Virginia

### Compliance Auditor:

Enclosed is the May 2012 discharge monitoring report (DMR) for the above facility. During May, samples were collected from external Outfall 001. Analytical results indicate that the discharge from these outfalls was within the limits set forth in the permit.

In addition, a report discussing the results from the biological sampling event conducted in May is also enclosed. Samples for biological toxicity were collected between the dates of May 6 and May 10.

If you would like additional information or have any questions, please feel free to contact me at (703) 503-3687.

Sincerely,

Michael Younce

Lead Terminal Operator

**Enclosures** 



2109A North Hamilton Street Richmond, Virginia 23230 Tel: (804) 358-8295 Fax: (804) 358-8297

### Certificate of Analysis

### Final Report

### Laboratory Order ID 12050190

Client Name: UR

**URS-Corporation** 

011

Date Received:

May 09, 2012

13825 Sunrise Valley Drive Ste 250

Date Issued:

May 15, 2012

Herndon, VA 20171

Submitted To: Jonathan Burkett

Project Number:

39452207.10000

Client Site I.D.: Joint Basin Corp VPDES Fairfax Terminal

Purchase Order:

Sub #125770.US

-Sample Summary List <sup>•</sup>

Laboratory

Sample ID

Sample ID

**Sample Date** 

**Receive Date** 

12050190-001

PS-001

05/08/2012

05/09/2012

**Ted Soyars** 

Laboratory Manager

#### End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Air Water & Soil Laboratories. Inc.





2109A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804) 358-8295 Fax: (804) 358-8297

### Certificate of Analysis

### Final Report

### Laboratory Order ID 12050190

Client Name:

**URS-Corporation** 

13825 Sunrise Valley Drive Ste 250

Date Received:

May 09, 2012

Date Issued:

May 15, 2012

Herndon, VA 20171

Submitted To: Jonathan Burkett

Project Number:

39452207.10000

Client Site I.D.: Joint Basin Corp VPDES Fairfax Terminal

Purchase Order:

Sub #125770.US

-Analytical Results

Sample I.D.: PS-001

Laboratory Sample I.D.: 12050190-001

Date/Time Sampled: 05/08/12 10:40

Parameter	Method	Sample Results	Qual Rep Limit	Samp Prep Date/Time	Analysis Date/Time	Analyst
TPH-Semi-Volatiles (DRO)	WI DNR M	< 0.5 mg/L	0.5	05/11/2012 14:00	05/14/2012 20:29	JHV
TSS	SM18/2540D	2.2 mg/L	1	05/11/2012 14:54	05/11/2012 14:54	EML

### Summary of Analytical QC Batches

QC Batch ID Method QC120515003 WI DNR M Sample List

QC120515032

12050190-001

SM18/2540D

12050190-001





Air Water & Soil Laboratories, Inc. 2109 A. North Hamilton Street Richmond, Virginia 23230 (804) 358-8295 - Telephone (804) 358-8297 - Fax

Date Issued: 05/15/2012

### **Analysis Certifications Report**

Х

Client Name:

**URS-Corporation** 

Client Site ID:

Joint Basin Corp VPDES Fairfax Terminal

Submitted To:

Jonathan Burkett

Order ID:

TSS

12050190

 Parameter
 Method
 NC
 VA-NP

 TPH-Semi-Volatiles (DRO)
 WI DNR M
 X

SM18/2540D

"X" denotes that the associated parameter is certified or accredited under the program indicated in the column header.

VA-NP = VELAP Non-Potable Water: Virginia DGS Division of Consolidated Laboratory Services(460021); NC: North Carolina(495)

Х

Certification Section: Page 1 of 1





CHAIN OF CUSTODY LABORATORIES, INC. PAGE COMPANY NAME: Com UR5 PROJECT NAME/Quote #: Join + Basin INVOICE TO: CONTACT: INVOICE CONTACT: SITE NAME: Fair fax ADDRESS: Sunrise Valley Ste 250 INVOICE ADDRESS: PROJECT NUMBER: 37452707. PHONE #: INVOICE PHONE #: P.O. #: Syb# 125770.45 FAX #: EMAIL: Jonathan, burkett 10, urs, com Pretreatment Program: Is sample for compliance reporting? NO Is sample from a chlorinated supply? YES PWS I.D. #: N/A SAMPLER NAME (PRINT): Janathan SAMPLER SIGNATURE: Turn Around Time: Day(s) Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soll/Solids OR=Drganic A=Air WP=Wipe OT=Other COMMENTS Preservative Codes: NeNittic Acid (Dissolved Metals) ANALYSIS / (PRESERVATIVE) C#Hydrochloric Acid S#Sulfurie Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acritate T=Sortium Thiosulfate Mattellioned Ġ Composite Start Time Composite Start Dafe Grab Date or Composite Stop Date Grab Time or Composite Stop Time Number of Container Matrix (See Codes) á. CLIENT SAMPLE I.D. Time Preserved Field Filtered Composite H Grab PLEASE NOTE PRESERVATIVE(S) INTERFERENCE CHECKS or PUMP RATE (Unim) PO 1040 WW 3) 5) 6) 8) 9) 10) RELINQUISHED: RECEIVED: QC Data Package DATE / TIME LAB USE ONLY COOLER TEMP 23 Level I Level II E1 12050190 **URS-Herndon** RELINQUISHED: DATE / TIME RECEIVED: DATE / TIME Level III Joint Basin Corp VPDES Fairf DUE: 5 Days Level IV 05/09/12 Recd:

#### TERMS & CONDITIONS

Where a purchaser (Client) places an order for laboratory, consulting or sampling services from Air Water & Soil Laboratories, Inc., a Virginia corporation (referred to as "Air Water & Soil "). Air Water & Soil shall provide the ordered services pursuant to these Terms and Conditions, and the related Quotation or Price Schedule, or as agreed in a negotiated centract. In the absence of a written agreement to the contrary, the Order constitutes an acceptance by the Client of Air Water & Soils offer to do business under those Terms and Conditions, and an agreement to be bound by those Terms and Conditions. No contrary or additional terms and conditions, and an agreement to the country or additional terms and conditions, are suppressed in a Client's document shall be geened to become a part of the contract created upon acceptance of these Terms and Conditions, unless accepted by Air Water & Soil in writing. pressed in a Client's document shall be do ORDERS AND RECEIPT OF SAMPLES

- 1. One Dear Incomplete the Order (Le. 2 sect) a Scope of Work) either by submitting a purchase order to Air Water & Soil in writing or by telephone subsequently confirmed in writing, or by negotiated contract (i.e. Chain of Custody). Whichever option the Citent selects for placing the Order, the Order shall not be valid unless it contains sufficient specification to enable Air Water & Soil to carry out the Client's requirements. In particular, samples must be accompanied by: a) adequate instruction on type of analysis requested, and b) complete written disclosure of the known or suspected presence of any hazardous substances, as defined by applicable federal or state law. Where any samples which were not accompanied by the required disclosure, cause interruptions in the lab's ability to process work due to contamination of instruments or work areas, the Client will be responsible for the costs of clean up and recovery.
- responsible for two coasts of coart up and recovery.

  1.2 The Client shall provide one week's advance notice of the sample delivery schedule, or any changes to the schedule, whenever possible. Upon timely delivery of samples, Air Water & Soil wis use its best efforts to meet mutually agreed turnaround times. All turnaround times are based on bushoss days and will be calculated from the point in time when Air Water & Soil has determined that it can proceed with delined work following receipt, inspection of samples, and resolution of any discrepancies in Chain-of-Custody forms and project guidence regarding work to be done (Sample Delivery Acceptance). In the event of any changes in the sample delivery schedule by the Client, prior to Sample, Delivery Acceptance, Air Water & Soil reserves the right to mostly its turnaround time commitment, to change the date upon which Air Water & Soil will accept samples, or refuse

- schedule by the Client, prior to Sample Delivery Acceptance for the affected samples.

  Sample Delivery Acceptance for the affected samples.

  1.2.1 Turn around times are defined as follows: Any sample group requiring a turnaround time of less than five(5) business days will be considered as "Rush Turn Around Time". Rush Turnaround samples received after 3:00pm will be considered as received on the next business day.

  1.2.2 Air Water & Soil definess "standard turnaround" as Five (5) business days with exception made for Full TCLP analyses.

  1.3 Air Water & Soil reserves the right, exercisable at any time, to refuse or revoke Sample Delivery Acceptance for any sample which in the safe judgment of Air Water & Soil: a) is of unsuitable volume; b) may pose a risk or become unsuitable for handling, transport, or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hexardous substance and whether or not such presence has been disclosed to Air Water & Soil by the Client; or c) holding times cannot be met, due to passage of more than 48 hours from the time of sampling or 1/2 the holding time for the requested (est, withouse in text). ichever is tess.
- A. Prior to Sample Delivery Acceptance, the entire risk of loss or damage to samples remains with the Client, except where Air Water & Soil provides courier services. In no event will Air Water & Soil have any responsibility or like action or inaction of any carrier shipping or delivering any sample to or from Air Water & Soil 's premises. Client is responsible to assure that any sample containing any hazardous substance which is to be delivered to Air Water & Soil 's premises will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

2. PAYMENT TERMS
2.1 Services performed by Air Water & Scil will be in accordance with prices quoted and later confirmed in writing or as stated in the Price Schodule. Quoted prices do not include sales tax. Applicable sales tax will be added in invoices where required by law. An Environmental Management Fee of 5% of the invoice value will also be applied, at Air Water & Scil's discretion.
2.2 Invoices may be submitted to Client upon completion of any sample delivery group. Billing corrections must be required within 30 days of invoice date. Payment in advance is required for all Clients oncept those whose credit has been established with Air Water & Scil. For Clients with opproved credit, payment terms or net 30 days from the date of invoice by Air Water & Scil. All overdue payments are subject to an additional interest and service charge of one and one half percent (1.5%) (or the maximum rate permissible by law, whichever is lesser) per month or portion thereof from the due date until the date of payment. All fees are charged or billed directly to the Client. The billing of a third party will not be accepted without a statement, signed by the third party, that acknowledges and accepts payment responsibile for all costs and expenses of collection including reasonable attorney's fees. Air Water & Scil are a very time in the event Client legal to make timely payment of its invoices. Client shall be responsible for all costs and expenses of collection including reasonable attorney's fees. Air Water & Scil reserves the right to refuse to proceed with work at any time based upon an unfavorable Client credit report.

3. Change ORDERR, TERMINATION

3. Changes on the Scope of Work, price, or result delivery date may be initiated by Air Water & Scil after Scarge Delivery Acceptance due to any condition which conflicts with analytical. OA or other protocols warranted in

- 3. Changes to the Scope of Work, price, or result delivery date may be initiated by Air Water & Soil after Sample Delivery Acceptance due to any condition which conflicts with analytical, CA or other protocols warranted in these Terms and Conditions. Air Water & Soil will not proceed with such changes until on agreement with the Client is reached on the amount of any cost, schedule change or technical change to the Scope of Work, and such agreement is documented. Email communications are acceptable, tetephane conversations however must be followed up with written documented. Email communications are acceptable, tetephane conversations however must be followed up with written documented on. 3.2 Changes to the Scope of Work, including but not limited to increasing or decreasing the work, changing test and analysis specification, or acceptation in the performance of the work may be initiated by the Client after sample delivery acceptance. Such a change will be documented in writing and may result in a change in cost and turnaround time commitment. Air Water & Soil's acceptance of such changes is contingent upon technical
- 3.2 Changes to us Scope of virth, including but not british by the Client and sample delivery acceptance. Such a change will be documented in writing and may result in a change in cost and turnaround time commitment. Air Water & Scil's acceptance of such changes is contingent upon technic feasibility and operational capacity.

  3.3 Suspension or termination of all or any part of the work may be initiated by the Client. Air Water & Soil will be compensated consistent with Section 2 of these Terms and Conditions. Air Water & Soil will complote all work to proper part of the work completed.

  4. WARRANTIES AND LIABILITY

  4. WARRANTIES AND LIABILITY

- 4. Where applicable, Air Water & Soil will use analytical methodologies which are in substantial conformity with published test methods. Air Water & Soil has Implemented these methods in its Laboratory Quality Manual and referenced Blandard Operating Procedures and where the nature or composition of the sample requires it, Air Water & Soil reserves the right to deviate from those methodologies as necessary or appropriate, based on the reasonable judgment of Air Water & Soil, which deviations, if any, will be made on a basis consistent with recognized standards of the industry and/or Air Water & Soil is tuberatory Quality Manuals. Client may request that Air Water & Soil perform according to a mutually egreed Quality Assurance Project Plan (QAPP). In the event that samples arrive prior to agreement on a QAPP, Air Water & Soil will preced with analyses under its standard Quality Manuals then in offset, and Air Water & Soil will not be responsible for any re-sampling or other charges if work must be repeated to comply with a subsequently finalized QAPP.
  4.2 Air Water & Soil shall start preparation and/or analysis within holding times provided that Sample Delivery Acceptance occurs within 48 hours of sampling or 1/2 of the holding time of the test, whichever is less. Where resolution of inconsistencies leading to Sample Delivery Acceptance occurs within 48 hours of sampling or 1/2 of the holding times and with the work provided that, in Air Water & Soil will use its best efforts to meet holding times and with the work provided that, in Air Water & Soil will use its best efforts to meet holding times and with the work provided that, in Air Water & Soil will use its best efforts to meet holding times and with the work provided that, in Air Water & Soil will use its best efforts to meet holding times and with the work provided that, in Air Water & Soil will use its best efforts to meet holding times and with the work provided that analysis was performed within the applicable holding time. Where reanalysis demanded to is be deemed to have been met

- provided the brittal analysis was performed within the appucable noting time. Where requirements are supported to have been med.

  4.3 Air Water & Soil warrants that it possesses and maintains all Ecensos and certifications which are required to perform services under these Terms and Conditions provided that such requirements are specified in writing to Air Water & Soil prior to Samplo Delivery Acceptance.

  4.3 The water & Soil prior to Samplo Delivery Acceptance.

  4.4 The water & Soil prior to Samplo Delivery Acceptance.

  4.5 The water & Soil prior to Samplo Delivery Acceptance.

  4.5 The water & Soil prior to Samplo Delivery Acceptance.

  4.6 The water & Soil prior to Samplo Delivery Acceptance.

  4.7 In an acceptance of the Water & Soil gree and makes NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. No representative of Air Water & Soil is authorized to give or make any other representation or wastranty or modify this warranty in connection with any services performed by Air Water & Soil in connection with any services performed by Air Water & Soil and of the Client's expense, edictional sample(s) of necessary. Any reanalysis requested by the Cleant generating Results consistent with the original Results will be at the Client's expense. If re-sampling in reconstancy, Air Water & Soil and of the Client's expense, edictional sample(s) of necessary. Any reanalysis requested by the Cleant generating Results consistent with the original Results will be at the Client's expense. If re-sampling to reample, whichever is less.

  4.8 Air Water & Soi's liability for re-sampling costs will be limited contract, tord, warranty, negligence or otherwise, shall be limited to the tesser amount of compensation for the services performed or St00,000. All claims, including negligence, shall be deemed warred unless suit thereon is filed within one year after Air Water & Soil be invited. Inclient or consequential damages occasion for the services performed or by application or use of the reports propared.

  4.7 In no
- Usual supports, unincures to delays in an application of the supports, unincures to delay an application of the supports of the Client upon receipt in full by Air Water & Soil or generated by services performed under this agreement shall only become the property of the Client upon receipt in full by Air Water & Soil or payment for the whole Order. Ownership of any analytical method, QAVQC protocols, software programs or equipment developed by Air Water & Soil for performance of work will be retained by Air Water & Soil, and Client shall not disclose such

- 9.1 usua or uncontainen provided to Air Water & Soil of generated by services performed under this agreement shall only become the property of the Client upon receipt in full by Air Water & Soil of payment for the whole Order. Ownership of any analytical method, OA/OC protocols, software programs or equipment developed by Air Water & Soil for performance of work will be retained by Air Water & Soil, and Client shall not disclose such information is generally available to the public of soil and sample materials provided by Client or at Client's request, and the result obtained by Air Water & Soil shall be held in confidence (untess such information is generally available to the public of soil and sample materials provided by Client or at Client's request, and the result obtained by Air Water & Soil shall be held in confidence (untess such information is generally available to the public of soil and sample materials provided by Client or at Client's request, and the result of these Terms and Conditions,) subject to any disclosure required by favore legal process.

  5.3 Should the Results delivered by Air Water & Soil be used by the Client or client's sample will be adjusted based upon mutual agreement. In no case shall the Client unreasonably withhold Air Water & Soil's right to independently defend its data.

  5.4 Air Water & Soil reserves the right to subcontract services cordered by the Client to another laboratory or laboratories, if, in Air Water & Soil's splayment, it is reasonably necessary, appropriate or advisable to do so. Air Water & Soil shall dispose of the Client's samples of avaices except for work potentiaries which have been unded and approved by Air Water & Soil.

  5.5 Air Water & Soil shall dispose of the Client's samples 30 days after receipt of samples; 15 days after receipt of samples for potentiary approved by Air Water & Soil.

  5.5 Air Water & Soil shall dispose of the Client, in a manner consistent with U.S. Environmental Protoction Agency regulations or other approach by a federal, state or

6.1 Air Water & Soil shall maintain in force during the performance of services under those Terms and Conditions, Workers' Compensation and Employer's Liability Insurance in accordance with the laws of the states having jurisdiction over Air Water & Soil's employees who are engaged in the performance of the work. Air Water & Soil shall also maintain during such perfod, Comprehensive General and Contractual Liability (limit of \$1,000,000 per occurrence/ \$2,000,000 aggregate), Comprehensive Automobile Liability, owned and hired, (\$1,000,000 combined single limit), and Professional Pollution Liability insurance (fimit of \$1,000,000 per occurrence/aggregate).
7. AUDIT

7.1 Upon prior netice to Air Water & Soil, the Client may audit and inspect Air Water & Soil's records and accounts covering reimbursable costs related to work done for the Client, for a period of two (2) years after completion of the work. The purpose of any such audit shall be only for verification of such costs, and Air Water & Soil shall not be required to provide access to cost records where prices are expressed as fixed fe published unit prices.

MISCELLANEOUS PROVISIONS

- 8. In Theso Terms and Conditions, together with any additions or revisions which may be agreed to in writing by Air Water & Soil, embody the whole agreement of the parties and provide the only remedies available. There are no promises, lerms, conditions, understandings, obligations or agreements other than those contained herein, and these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Client and Air Water & Soil. Those Terms and Conditions, and any transactions or agreements to which they apply, shall be governed both as to interpretation and
- agreements, erner verbal or written, between the Cuert and Air Vistar & Soil. I flost i fems and Conditions, and any transactors or agreements to which they where Air Water & Soil as vertices are performed.

  3.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition bereof shall not affect in any way the validity or enforceability of the remainder to these Terms and Conditions are intended society for convenient reference and shall not define, limit or effect in any way those Terms and Conditions are intended society for convenient reference and shall not define, limit or effect in any way those Terms and Conditions are intended society for convenient reference and shall not define, limit or effect in any way those Terms and Conditions interpretations. No waiver by either party of any provision, term or condition hereof or 6 any obligations, filebilities, and remedies of the parties, as provided herein, are exclusive and in Seu of any others available at law or in equity. Indemnifications, reloases from liability and limitations of liability shall apply, notwithstanding the fault, negligence or willful misconduct.

Sample Condition Form#: F1302 Rev. #; 1.0 Effective: August 2, 2010 Page 1 of 1



2109A North Hamilton Street • Richmond, Virginia 23230 • Tel : (80 URS-Herndon

12050190

Joint Basin Corp VPDES Fair DUE:

5 Days

	Sample Conditions Checkii William	16 16 16 16 16 16 16 16 16 16 16 16 16 1	Recd: 05/09/12
Open	ed by: (Initials) Lab ID No.:		
	Date Cooler Opened:	5-9-1	9
1.	How were samples received?	YES	NO N/A
3	Courier Walk In		PS DAIZ
2.	Were custody seals used?		
3.	If yes, are custody seals unbroken and intact at the date and time of arrival?		D-10 (39')
4.	Are the custody papers filled out completely and correctly?		
<b>5</b> .	Do all bottle labels agree with custody papers?	卤	
6.	Are the samples received on ice?		
7,	Is the temperature blank or representative sample within acceptable limits? (above freezing to 6°C)	回	
8.1	Are all samples within holding time for requested laboratory tests?		
9	Is a sufficient amount of sample provided to perform the tests indicated?	<b>a</b>	
10	Are all samples in proper containers for the analyses requested?	回	
11	Are all samples appropriately preserved for the analyses requested?	团	
12	Are all volatile organic containers free of headspace?		
	COMMENTS		
			=
•			
		——————————————————————————————————————	
<del></del>			F/
······································			MIN
11	Are all samples appropriately preserved for the analyses requested?  Are all volatile organic containers free of headspace?	d d 0	



### James R. Reed & Associates

### **Environmental Testing**

770 Pilot House Drive • Newport News, Virginia 23606 (757) 873-4703 • Fax 873-1498

### Memorandum

Date May 22, 2012

To: Lindsay Pierce, URS Corporation

From: Lei Dong, James R. Reed & Associates

Subject: Toxicity testing results for outfall 001

Attached is a bioassay report for outfall 001. The results of the toxicity tests are the following:

Chronic C. dubia toxicity test:

NOEC=6.25% effluent (TUc=16)

Chronic P.promelas toxicity test:

NOEC=25% effluent (TUc=4)

If you have any questions and comments, please call me.



May 21, 2012

Fairfax Terminal Complex Sample ID: Outfall 001 NPDES#: VA0001872 JRA ID: 12-07090

Chronic Ceriodaphnia dubia Toxicity Test Chronic Pimephales promelas Toxicity Test

> Performed for: URS Corporation Lindsay Pierce

13825 Sunrise Valley Drive Suite 250 Herndon, VA 20171

Performed by:

James R. Reed & Associates 770 Pilot House Dr. Newport News, VA 23606

Respectfully,

Elaine Claiborne
Laboratory Director

Reproduction of this report is not permitted, except in full, without written approval from James R. Reed & Associates.

The results of this report relate only to the sample(s) provided for analysis.

VELAP# 460013

Results conform to NELAC standards, where applicable, unless otherwise indicated.

EPA# VA00015



## TEST SUMMARY SHEET (For Marine and Freshwater Tests) EPA 1002.0

Facility: Fairfa	x Terminal Cor	nplex		_NPDES	Permit #:	VA0001872
Outfall/Receiving	Stream:	001			_JRA #:	12-07090
Test Period for Wi (i.e., first quarter, s	hich Data is Bei semiannual, or a	ng Submitt innual)	ted:	Annual to	est	
	5	SUMMAR	Y OF TEST	CONDITI	ONS .	
Test Si	tart:		Date 5/8/2012		Time 1120	-
Test E	nd:		5/15/2012		0900	
Test Ty	pe (chronic/acu	ite):	Chronic		_	
Test Or	ganism:	Cerioda	phnia dubia		_Age:	<24 hour
Test Ch	namber Size:	30 mL				
Volume	of Test Solution	n per Char	nber:	15 mL		_
Diluent	20% DMW	7			·	-
	amber Aeration otoperiod: regime:	Period	None 16hrs light / 0.1 mL S.cap	8 hrs dark	(50-100 ft and 0.1mL	-c) YCT daily
	RAN	GE OF C	HEMICAL P	ARAMET	TERS	
Parame	ter		Effluent			Diluent
1. <u>Chlor</u>	ine (mg/L) Initial		<0.02			<0.02
	Adjusted		N/A			
2. <u>Salini</u>	ty (ppt) Initial		<1			N/A
	Adjusted	,	N/A			
3. <u>pH</u>	Initial Adjusted		7.22-8.01 N/A		-	7.78-8.18

Page 2

fairfaxterminal XI Q

JRA#	: 12-07090	Test Type& Organisms Ch-	omia Camia dunal
	22	Test Type&Organism: Chro	
	RANGE OF CHI	EMICAL PARAMETERS (Continued on the Continued on the Cont	nued):
Param	eter	Effluent	Diluent
4. <u>Alk</u>	alinity (mg/L as CaCO <sub>3</sub> )	29-30	62-64
5. <u>Amı</u>	monia (mg/L)	N/A	N/A
6. Hard	lness (mg/L as CaCO <sub>3</sub> )	41-46	80-88
7. <u>Con</u>	ductivity (µmhos/cm)	150-158	170-176
8. <u>DO</u> (	mg/L)	7.9-8.4	8.0-8.3
9. Meth	ods Used for Adjustme	nt of Test Solutions	
	Chlorine N/A Salinity N/A pH N/A		
		TEST RESULTS	
1. <u>Test A</u>	Acceptability		
	Control Survival (%	)	100%
	Average Weight per	Control Organism (mg)	N/A
	Average Number of	Young per Control (C. dubia)	27.3
	60% of Control Fema	ales (C. dubia) with 3 Broods?	yes
	Total Number of Mal Known Parentage?	le <i>C. dubia</i> in the Test  N/A	none
	Percent Females Prod	lucing Eggs (M. bahia)	N/A
2. Method	d(s) of Statistical Analys	ses .	
	Survival: Reproduction: IC25: LC50( at 48 hours):	Fisher's Exact Test Steel's Many-One Rank Test Linear Interpolation Visual observation	

JRA#:	12-07090	)	Test Type&	&Organisı	n: Chronic	Ceriodaph	mia dubia
			TEST RE	SULTS (	Continued)	1	#1
3. Statistic	cal Results	(as appropr	riate)				
ii.							
	•	48 hours):			>100%		
	TUa				<1	_	
	IC25 Survival			AIOEO	8.37%	- (7.070)	
	Survival	Normal	Distribution (y	(NOEC)	100% N/A	_(LOEC)	>100%
			eneous Varianc	,			
				0 (000,110)	11/21	<del>-</del>	
	Reproduc	tion	æ	(NOEC)	6.25%	(LOEC)	12.5%
		Normal	Distribution (y	es/no)	по	i e	
		Homoge	neous Varianc	e (yes/no)	no	_	
	TUc				16	5	
	PMSD	<b>.</b>	_		<u>n/a</u>		
	Reference	Toxicant T	est Date		5/1/2012	_	
		ID No.	M > 3		T00162	_	
		Result (n	ng/L) ge (mg/L)		0.00125		0.004
٧		QC Nang	ge (mg/L)		0.00125	thru	0.005
4. Equipme	<u>ent</u>	(Make	Model		Serial #		Probe #)
pH meter		VWR	SB21		00005173		Fl
DO meter		YSI	5000		97J0177		N
SCT meter		Orion	3 Star		000642		A1
Temperature		VWR	digi-thermo		N/A		N/A
Chlorine		НАСН	Colorimeter <sup>T</sup>	MII	00000994		N/A
5. Protocol I	Deviations/	Comments					
200							
_				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	1.	
_						10	
-	- ii						
					-		

## EFFLUENT USE SHEET (CHRONIC RENEWALS)

Facility:

Fairfax Terminal Complex

VPDES Permit # VA0001872

Outfall/Receiving Stream: 001

JRA#:

12-07090

Test/Organism:

Chronic Ceriodaphnia dubia

SAM	PLE COLLE	ECTION				
Date(s	Date(s) Time(s)		S	SAMPLE USE		
From:	To:	From:	To:	Date(s)	Time(s)	Test Day
5/6/2012	5/7/2012	1000	0900	5/8/2012	1120	0
		Yi .	11	5/9/2012	0920	1
5/8/2012	5/9/2012	1030	0930	5/10/2012	1045	2
5/9/2012	5/10/2012	1035	0935	5/11/2012	1100	3
		= +3	¥	5/12/2012	1000	4
				5/13/2012	0950	5
				5/14/2012	0945	6

The first use of a sample must be within 36-hours of retrieval from the sample collection device. Last use of sample must be within 72 hours of first.

Initial

Initial

3. <u>pH</u>

Adjusted

Adjusted

## TEST SUMMARY SHEET (For Marine and Freshwater Tests) EPA 1000.0

					14	
Facility:	Fairfax Terminal Con	mplex	NP.	DES Permit #:	VA0001872	
Outfall/R	eceiving Stream:	001		JRA #:	12-07090	×
	od for Which Data is Be quarter, semiannual, or		ed: Ann	nual test	0	= ==
		SUMMAR	Y OF TEST CON	DITIONS		
	Test Start:		Date 5/8/2012	Time 1115		
	Test End:		5/15/2012	1015		
	Test Type (chronic/ac	ute):	Chronic	, t		
ω	Test Organism:	Pimepho	ales promelas	Age:	<24 hours	
12	Test Chamber Size:	500mL	24	e) Vii		
	Volume of Test Solution	on per Chai	mber: 250n	nL		
	Diluent: 20% DMV	V	36 3			
	Test Chamber Aeration Test Photoperiod: Feeding regime:		None 16 hrs light / 8 has accentrated rinsed Artemia			,
	RAI	NGE OF C	HEMICAL PARA	METERS		
	Parameter		Effluent		Diluent	
	1. <u>Chlorine (mg/L)</u> Initial		<0.02		<0.02	
	Adjusted	90	N/A			
	2. Salinity (ppt)					

<1

N/A

N/A

Page 6

6.53-7.60

N/A

7.05-8.18

fairfaxterminal.XLS

Test Type&Organism: Chro	onic Pimephales pron
CHEMICAL PARAMETERS (Contin	nued):
Effluent	Diluent
aCO <sub>3</sub> ) 29-30	62-64
N/A	N/A
CO <sub>3</sub> ) 41-46	80-88
em) 150-158	170-176
4.5-8.4	5.5-8.3
I/A I/A I/A	26
TEST RESULTS	
***	
val (%)	100%
ht per Control Organism (mg)	0.916
ber of Young per Control (C. dubia)	N/A
ol Females (C. dubia) with 3 Broods?	N/A
of Male C. dubia in the Test age? N/A	N/A
es Producing Eggs (M. bahia)	N/A
Analyses Steel's Many-One Rank Test Dunnertt's Test Linear Interpolation	
	Effluent  aCO <sub>3</sub> ) 29-30  N/A  CO <sub>3</sub> ) 41-46  asm) 150-158  4.5-8.4  astment of Test Solutions  J/A  J/A  J/A  J/A  J/A  J/A  J/A  J/

TEST RESULTS (Continued)

Test Type&Organism: Chronic Pimephales promelas

12-07090

JRA#:

				(001111111111111)		
3. Statist	ical Results	(as approp	riate)			
	LC50 (at	48 hours):		>100%		
	TUa	,		<1	_	
	IC25			>100%		
	Survival		(NOEC		(LOEC)	>100%
		Normal	Distribution (yes/no)	yes	_(DODC)	-10070
			eneous Variance (yes/		<del>-</del>	
			() • 5 · · ·	110	_	
	Growth		(NOEC	25%	(LOEC)	50%
		Normal	Distribution (yes/no)	yes	_(2020)	3078
			eneous Variance (yes/r		<del>_</del>	
	TUc		•	4		
	<b>PMSD</b>			5.90%		
	Reference	Toxicant 7	Test Date	5/8/2012		
		ID No.		T00164	<del>-</del>	
		Result (1	ng/L)	0.02		
		-	ge (mg/L)	0.005	thru ·	0.02
					-	
4. Equipm	ent	(Make	Model	Serial#		Probe #)
pH meter		VWR	SB21	00005173		F1
DO meter		YSI	5000	97J0177		N
SCT meter		Orion	3 Star	000642	4	Al
T		1 111 15		R <sup>i</sup>		
Temperatur	e	VWR	digi-thermo	N/A		N/A
Chlorine		HACH	Colorimeter <sup>TM</sup> II	00000994		N/A
5 Protocol	Deviations/	Comments	8			
J. 1100001	20114110113/	Communities	!			
				***		
	- Q	·				
					<u></u>	
						84

## EFFLUENT USE SHEET (CHRONIC RENEWALS)

Facility :

Fairfax Terminal Complex

VPDES Permit # VA0001872

Outfall/Receiving Stream: 001

JRA#:

12-07090

Test/Organism:

Chronic Pimephales promelas

SAM	PLE COLLE	CTION				
Date(s) Time(s)		SAMPLE USE				
From:	To:	From:	To:	Date(s)	Time(s)	Test Day
5/6/2012	5/7/2012	1000	0900	5/8/2012	1115	0
	1			5/9/2012	1000	1
5/8/2012	5/9/2012	1030	0930	5/10/2012	1050	2
5/9/2012	5/10/2012	1035	0935	5/11/2012	1115	3
		· · · · · · · · · · · · · · · · · · ·		5/12/2012	1045	4
				5/13/2012	1050	5
				5/14/2012	1000	6

The first use of a sample must be within 36-hours of retrieval from the sample collection device. Last use of sample must be within 72 hours of first.

### **CUMULATIVE DATA SUMMARY**

### Fairfax Terminal Complex

NPDES: VA0001872 Effective date of current permit: <u>12/29/2009-12/28/2014</u>

### Outfall 001

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	p 4	Vertebrate NOEC %	
6/14/2011			100%	TUc=1	100%	TUc=1
5/8/2012			6.25%	TUc=16	25%	TUc=4
			54.7			
			2 X	(8)		13
						3.
					2	
			39			



TRA# 12-07090

### PHYSICAL/CHEMICAL DATA

NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001

	-		7	T =========	T			001	<del></del>	
CONC: CONTROL	- :V	DAYO	DAYI	DAY 2	DAY3	DAY4	DAY 5	DAY 6	DAY 7	DAY 8
TEMP	NEW	24.1	24.7	24.1	24.4	241	241	24.	N/A	N/A
	END	N/A	2500	25.2	25.1	2516	251)	2511	25.4	= (
рН	NEW	7.98	1.95	8.03	7.97	1.95	8.18	8.10	NA	N/A
	END	N/A	1.79	7.91	7.88	7.78	817	7-98	8.09	-
DO	NEW	8.3	8.1	8.2	8.1	8.2	8.1	8.3	MA	N/A
	END	N/A	8.1	8-3	8.1	8.0	8,0	8.7	8,2	
COND (µmhos/cr	n)	176	172	171	170	171	170	171	MA	N/A
DATE		5/8/12	5/9/12	Tholiz	Stolp	5/12/12	5/13/12	5/14/12	. / 1	
INITLALS	1	Ku	Kul	(Cus	Ru	Ku	Kil	lan	Ku	

CONC: 6.25%		DAY 0	DAY 1	DAY 2	DAY3	DAY4	DAY 5	DAY 6	DAY?	DAYB
TEMP	NEW	24.1	24.1	24.2	24.2	24.1	24.1	241	N/A	N/A
	END	N/A	25.0	25.2	25.	25,0	25.1	25.1	25.4	
рН	NEW	7.89	7.88	7.85	1.83	7.91	8-13	8,13	MA	N/A
	END	N/A	7.74	7-73	7.82	7.59	8-14	7.80	8.02	
DO	ЙЕМ	8.2	8,3	8-1	8.1	8.2	8.2	8/3	NIA	N/A
	END	N/A	8.1	8,2	8.0	8.1	8.0	8.1	8.1	
COND (umbos	(cm)	175	170	170	169	169	168	167	NIA	N/A

CONC: 12.5%		DAYO	DAY 1	DAY 2	DAY3	DAY4	DAY 5	DAY 6	DAY 7	DAY 8
. TEMP	NEW	24.2	24.1	24.4	24.3	24.1	241	24.1	MA	N/A
·	END	N/A	25.0	25.2	25.1	25.0	251	251	25.4	
pH_	NEW	7.83	7.85	7.77	7.74	7.82	8.01	- ~	NA	N/A
	END	N/A	7.70	コマン	7.76	7.53	8.05	7.83	7.96	
DO	NEW	8.1	8.1	8.1	8.0	8.2	8.0	8.2	NA	N/A
	END	N/A	8,0	3.7	7,9	8.1	8.0	8.0	8.1	
COND (µmhos	(cats)	174	148	169	168	168	167	166	N/A	N/A



IRA# 12-070 &0

### PHYSICAL/CHEMICAL DATA

NPDES#: VA	000187	72	CLIEN	Γ: <u>Fairfa</u>	x Termir	al Com	olex OU.	FALL:	001	
CONC: 25%		DAY 0	DAY 1	DAY 2	DAY 3	DAY4	DAY 5	DAY 6	DAY 7	DAY 8
TEMP	New	24.3	24.5	24.5	24.4	24,2	24,2	24	NA	NA
	END	N/A	25:0	25.2	25.1	2510	25,1	25:1	25.4	201
Нq	NEW	7.78	7.79	4.69	166	7,69	7.96	8.01	NA	N/A
	END	N/A	7.67	7165		1.42	7.99	7.80		
100	NEW	8.1	8.1	8.	8,0	8.2	8.0	81	NA	N/A
	END	N/A	7.9	8-2	7.9	8,0	7.9	8.0	8.0	
COND (\unnbos/c	m)	(71	167	168	166	166	164	163	N/A	N/A
DATE		5/8/12	514112	5/10/17	5/11/12	5/12/12	5/13/12	5/14/12	5/15/12	
INITIALS	-	KU	1cm	KU	pu	lles	ay	ku	nu	

CONC: 50%		DAYO	DAY 1	DAY 2	DAY3	DAY 4	DAY 5	DAY 6	DAY7	DAY 8
TEMP	NEW	24.3	24,5	24.8	24.4	24,2	24.2	24:1	NA	N/A
	END	N/A	25.0	25.2	25.1	25.0	25.)	25.1	254	
pН	NEW	7.71	7.72	7-58	7.51	7.51	7.87	7.88	NA	N/A
	END	N/A	7.82	754	7.57	7.31	7.86	7.70	7.74	
DO	NEW	8.1	8,0	6.1	8.1	8.2	8.0	8.1	NA	N/A
	END	N⁄A	7.9	8-2	7.9	7.9	7.9	8.0	8.0	
COND (µmho	6/cm)	165	163	164	160	160	159	158	NA	N/A

CONC: 100%		DAYD	DAYI	DAY 2	DAY 3	DAY4	DAY 5	DAY 6	DAY 7	DAY 8
TEMP	NEW	24.7	25.1	24.6	25:0	25,0	24.6	ملاء ع	NA	N/A
	END	N/A	25.0	25.2	25.1	35,0	251	25.	25.4	
pН	NEW	7.24	7.48	7.35	7.22	7.40	7.54	7.60	NA	N/A_
	END	N/A	8.01	7.33	7.40	7.25	771	7.69	7.63	
DO	NEW	8.4	8.2	8-3	8.4	8.3	8,2	8.2	MA	N/A
	END	N/A	81	8-1	7.9	7.9	7.9	7.9	7.9	
COND (umbo	s/cm)	126	158	155	151	ırl	150	151	NA	N/A



JRA# 12-07090

### **OBSERVATIONS**

NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001
START DATE: 5/3/12 TIME: 1/20 INIT: 40 END DATE: 5/47/12/IME: 0900

								and his		0100
CO210	T		N	UMBER OF	YOUNG PR	ODUCED PE	DAY			
CONC	REP	DAY I	DAY 2	DAY3	DAY 4	DAYS	DAY 6	7		
CONTROL	1	0	0	0	6	10	0	DAY 7	DAY 8	TOTAL
	2		Ĭ	T	6		-	9	+	25
	3				6	11		10		27
		++	1-1	-	,	12		10		28
Mean young per	T-	-1-+	+-+		6	11		to		27
young per	5		1-1		5	12		12		
27.3	6				6	10		12		29
21.1	7			1	5					28
	8		1 2	1	4	10	-	10		25
Survival: 100	9	1-1-	<del>                                     </del>	1				12		27
		1-1-	0 (4)	+,+	6	10	14	O		0
	10	V 1		V	6	9	0	12	2	
DATE )			10 3	11 5	112	5/13/3	till.			
TIME	00	00 10	145 11	00 1	940	950 0	945	08-7		
INIT	1 <	0			14		141	0900		
						Vin	20	40.		

CONC		<u> </u>	N	UMBER OF	YOUNG PR	ODUCED PE	RDAY			
	REP	DAYI	DAY2	DAY 3	DAY 4	DAYS	DAY 6			
6.25%	I	0	0	0	6	ð	V	DAY 7	DAY8	TOTAL
	2		1	1	1		+	12		27
	1 3	30.0		1	0	8	4	10		22
	4				6	10	0	14		200
					6	19	0	10	-	30
dean young per	5				6	8	0			U
	6				4	G	U	10	-	4
9	7	T	1-1		-	7	0			Lif.
21. 1 100		+-+	++		6	9	0	10	2	0
100	8	+	-	_	6	9	0	10	13	-
rvival: %	9	1			6	8	1	10		1
	70	y .	V	V	E	2	+	12	2	6

(Indicate comments with an \* and document on General Comments page)

X = adult dead, # = # live young, (#) = # dead young



JRA# 12-07090

### OBSERVATIONS (cont.)

NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001

		·	M	MBER OF	YOUNG PRO	DUCED PER	DAY				
CONC	REP	DAYI	DAY2	DAY3	DAY4	DAY 5	DAY 6	DAY 7	DAY 8	TOTAL	Τ
12.5%	1	0	0	0	0	0	0	12		8	T
	2			1	1			7		7	1
	3				6	1		6		12	,
	4				Ð	1		3		6	T
Mean young per	5		2		4	6	1	3	Е	13	
	6				2	2		6		10	-
9.9	7				3	5		9		10	
4.9	8				ろ	4		h		7	
urvival%	9	,			5	10		R		23	
	10		J/T	V	n	1	1/	8		3	_

				<u></u>					·		
<b> </b>	7		N	JMBER OF Y	OUNG PROI	DUCED PER	DAY				
CONC	REP	DAYI	DAY2	DAY3	DAY4	DAY 5	DAY 6	DAY 7	DAYB	TOTAL	
25%	1	0	0	0	0	c)	0	0	1	$\bigcirc$	
	2							0	4	0	
	3								Hoter	3	
	4		1/2	-   -				0		0	
Mean young per	5							0		O	
07	6		-   -			1		0		0	
	7			-		1					
180	8					0				0	
Survival:	9		1/			1.		V			
	10_	V	<u> </u>	<u>U</u>	W	D	V	2		a	



JRA# 12-67090

### OBSERVATIONS (cont.)

NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001

	1		M	JMBER OF Y	OUNG PROI	OUCED PER	DAY			
CONC	REP	DAY 1	DAY2	DAY3	DAY4	DAY 5	DAY 6	DAY 7	DAY 8	TOTAL
50%	1	0	0	0	Ð		0	٥		0
	2					0	0	0	200	O
	.3			19			0	1		
	4				V		2	(7)		3
fean young per	5	. 3				3.0	0	1		
	6				0	Ē.2	2		7	2
2.2	7				1	V	4			(4)
3.2 100	В				0	4	0			4
rvival:%	9				4	7	V	j		13
	10	4	V	V	0	1	7	3		2 5

	13		אז	JMBER OF Y	OUNG PRO	DUCED PER	DAY	<del></del>			-
CONC	REP	DAY 1	DAY2	DAYB	DAY4	DAY 5	DAY 6	DAY 7	DAY 8	JOTAL	Τ
100%	1	_0_	0	0	0	Ð	0	()		0	
	2					x _		->	-	(X	
	3						2	0		2	
	4						2	2		4	
Mean young per	5			11			O	1			
3.4	6				y	V	2	à		4	
	7				3	7	Q	0		10	
90	8					0	7	0		4	
Survival: %	9				3	3	0	0		6	
	10	1	V	V	n	0	3	(2)		3	



### RANDOMIZATION TEMPLATE #1

NPDES# VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001

Concentration	Rep	Position #	Concentrati	on Rep	Position #	
Control	1	5	25%	1	2	
	2	9		2	8	
	3	16		3	18	
	4	20		4	23	
	5	25	•	5	30	
	6	32		6	34	
	7	37		7	41	
	8	44	,	8	48	
	9	53		9	54	
	10	58		10	60	
6.25 %	1	1	50 %	1	3	
	2	7			11	
	3	15		2 3	13	
	4	19		4	24	
	5	28		5	29	
	6	36		6	31	
	7	42		7	38	
	8	45		8	46	
	9	50		9	51	
	10	56		10	59	
12.5%	=1	4	100 %	1	6	
	2	12		1 2 3	10	
	3	14		3	17	
	4	22		4	21	
(8	5	26		5	27	
	6	35		6	33	
	7	39		7	40	
	8	43		8	47	
	9	49		9	52	
	10	55		10	57	



### JRA# 12-07090

### GENERAL COMMENTS

NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001

TRE	ATMENT PREP	ARATIONS CAL	CULATIONS	2	VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC(%)	TOTAL VOLUME (mL)	STOCK CONC (%)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS	Ly	f.Pa	4
Control	1200	NHA 100%		1200	NUMBER OF ORGANISMS	4		Ð
6.25%	1200	100%	75	1125	REPRODUCTION CALCULATIONS	4	al la se	
12.5%	1200	100%	150	1050	STATISTICAL ANALYSES	9	×	
25%	1200	100%	300	900	·			
50%	1200	100%	600	600	n **		đi.	
100%	1200	100%	1200	0			Kerim	ku
CALCULATIONS PERF	ORMED BY:	1	1					

TEST CHAMBER		B# 6	TYPE: po	vpropylene		VOLT	JME OF TEST	SOLUTION:		15mL		
SISTERS FROM:	YGA	YGB	YGC	Yel	YGE	YGE	DME OF TEST	YGH	167	YGT		
PLACED IN REP:	عملناد	2	3.1.	4	5			8	9	10		
PLACED IN REP: AGE OF ORGANI	SMS_hrs - Colle	cted: Date	218/11	From (time)	0600		236					
COMMENTS:												
			20						=			-
		20	7A U									
						100						
											-	<del> </del>
							<del></del>					
		<del></del>										
								1		15		
		1						П				
			= =	19				•				
II.												
			51		<del>-</del>							
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									_			
	<del></del>					[4			_		67	il.
				iii					15			
			-									



### JRA# 12-07090

### WATER QUALITY

NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001

					SAMPLI	e (prior to	RENEWAL	5)			4		
DATE	DAY	COLLECTION DATE/TIME	ARRIVAL DATE	TEMP (°C)	INIT pH	FINAL pH (6-9)	INIT DO (mg/L)	FINAL DO (mg/L)	COND (µmhos)	INIT TRC (mg/L)	FTNAL TRC (mg/L)	HARD (mg/L)	ALK (mg/L)
518112	0	5/6/12 1000	5/8/12	24.7	673	7.24	9.7	8.4	156	20.02	1	332	
5/9/12	1	• •		251	6.83	7,48	10,2	8,2	158	<0.82	- Q	832	
5/10/12	2	5/8/12 1030		246	7.67	7.35	9.6	8.3	155	2002		1803	i
5/11/12	3	5/9/12 1035 5/1912 1935	5/11/12	25.0	692	7.22	9:5	8:4	151	<ac2< td=""><td>-</td><td>303</td><td></td></ac2<>	-	303	
5/12/12	4	- (1	11	25.0	6.77	7.40	10.0	8.3	15)	20:02	_	74	30
5/13/12	5	11	<b>~</b> )	74.6	7.05	7.54	10.6	8.2	150	20.02		74	30
5/14/12	6		• (	25.0	6.91	7.60	107	8,2	151	20.02		74	3 =
	7	2	11 11				ls.			10.3			

DO Adjustments

Date 5/8/12 5/4/12 5/10/12 5/11/12 5/12/12 5/13/12

Method Dente perche perche per ute perche Derive

Minutes 13 15 15 15

Please Sex Hardness here. \*1 Sauple: 42 mg/c \*2 Sauple 46 mg/c \*3 Sauple 41 mg/c

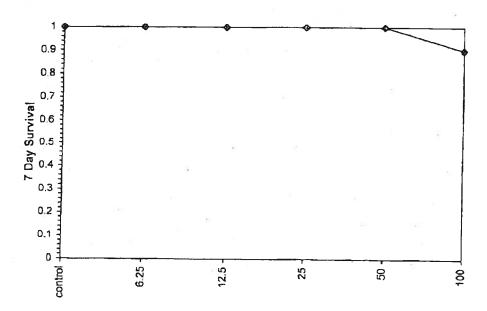
		ווס	LUENT (	20% DMW		_ <b>)</b>			
DATE	DAY	DATE MADE	TEMP (°C)	рĦ	DO (mg/L)	COND (pmhos)	IRC (mg/L)	HARD (mg/L)	ALK (mg/L)
5/8/12	0	5/5/12	24.1	7.98	8,3	176	<0.62	80	62
519112	1	5/1/12	24.7	7.95	8.1	172	40.02	81	64
5/10/12	2	5/7/12	24,1	8.03	8-2	171	20.02	83	64
5/11/12	3	5/8/12	24.2	747	8.1	170	20.02	83	Got
5/12/12	4	519112	24.1	7.95	812	171	1002	22	64
5/13/12	5	5/10/12	24.1	8.18	8.1	170	20.02	88	63
3114112	6	5/11/12	24,1	8.10	8.3	iTi	<1102	82	62
	7	8							

Start	Date:	5/8/2012			aphnia Su 12-07090		Reprod	Sample II		12-07090		
End [		5/15/2012		Lab ID:	JRR			•				
Samp	le Date: nents:				EPAF 94-	EPA/600/4	1-91/002	Sample To		EFF2-Ind CD-Cerio	daphnia dubia	
	nc-%	1	2	3	4	5	6	7	8	9	10	
	control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
	6.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
	12.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
	25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
	50	1.0000	1.0000	1,0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
	100	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	

-					Not	255	4	Fisher's	1-Tailed		
	Conc-%	Mean	N-Mean	Resp	Resp	Total	N	Exact P	Critical		
	control	1.0000	1.0000	 0	10	a 10	10				···
	6.25	1.0000	1.0000	0	10	10	10	1.0000	D.0500		
	12.5	1.0000	1.0000	0	10	10	10	1.0000	0.0500		
	25	1.0000	1.0000	0	10	10	10	1.0000	0.0500		
	50	1.0000	1.0000	0	10	10	10	1.0000	0.0500		
	100	0.9000	0.9000	1	9	10	10	0.5000	0.0500		<b>*</b>

Fisher's Exact Test 100 >100 1	Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	
Treatments vs control	Fisher's Exact Test	100	>100	10	1	
170000000000000000000000000000000000000	Treatments vs control	1_				9



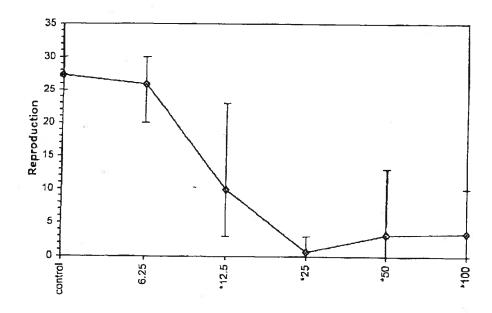


			Ceriod	aphnia Su	rvival and	d Reproc	uction Te	st-Repro	duction	-		
Start Date: End Date: Sample Date: Comments:	e: 5/15/2012 L Date: F			12-07090 JRR I: EPAF 94-EPA/600/4-91/002			Sample II Sample T	): ype:				<del></del>
Conc-%	1	2	3	4	5	6	7	8	9	10		
control	25.000	27.000	28.000	27.000	29.000	28.000	25.000	27.000	30.000	27.000		
6.25	27.000	28.000	30.000	25.000	24.000	24.000	- 30.000	25.000	26.000	20.000		
12.5	8.000	7.000	12.000	6.000	13.000	10.000	10.000	7,000	23,000	3.000		
25	0.000	0.000	3.000	0.000	0.000	0,000	1.000	0.000	1.000	2.000		
50	0.000	0.000	1.000	2.000	1.000	2.000	5.000	4.000	13.000	4.000		
100	0.000	0.000	2.000	4.000	1.000	4.000	10.000	4.000	6.000	3.000		

				Transform	n: Untrar	sformed	V	Rank	1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical		4
control	27.300	1.0000	27.300	25.000	30.000	5.740	10			11	71
6.25	25.900	0.9487	25.900	20,000	30.000	11.718	10	89.00	75.00		
*12.5	9.900	0.3626	9.900	3.000	23.000	55.213	10	55.00	75.00		
*25	0.700	0.0256	0.700	0.000	3.000	151,336	10	55.00	75.00		
*50	3.200	0.1172	3.200	0.000	13.000	120,402	10	55.00	75.00		
*100	3,400	0.1245	3,400	0.000	10.000	88.995	10	55.00	75.00		

Auxiliary Tests					Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates nor	n-normal dis	stribution	$(p \le 0.05)$		1.18438	0.895	1.5425	5.17525
Bartlett's Test indicates unequal	variances (	p = 1.36E	-04)		25.0577	15.0863	,,	0
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU				
Steel's Many-One Rank Test	6.25	12.5	8.83883	16	-	· · · · · · · · · · · · · · · · · · ·		
Treatments vs control	1	. /		/				

Dose-Response Plot



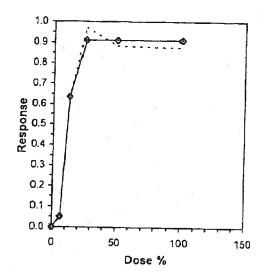
			Ceriod	laphnia Su	rvival an	d Repro	iuction Te	st-Repro	duction		· · · · · · · · · · · · · · · · · · ·
Start Date: 5/8/2012 End Date: 5/15/2012 Sample Date: Comments:		3	Test ID: Lab ID:	12-07090 JRR EPAF 94-			Sample II	): ype:	12-07090 EFF2-Inde		
Conc-%	1	2	3	4	5	6	7	8	9	10	
control	25.000	27.000	28,000	27.000	29.000	28.000	25.000	27.000	30.000	27.000	
6.25	27.000	28.000	30.000	25.000	24.000	24.000	30.000	25.000		20.000	
12.5	8.000	7.000	12.000	6.000	13.000	10.000	10,000	7.000	23.000	3.000	
25	0.000	0.000	3.000	0.000	0.000	0.000	1,000	0.000	1.000	2.000	
50	0.000	0.000	1.000	2.000	1.000	2.000	5.000	4.000	13.000	4.000	
100	0.000	0.000	2.000	4.000	1.000	4.000	10.000	4.000	6.000	3.000	

				Isotonic						
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	-		N-Mean
control	27.300	1.0000	27.300	25,000	30.000	5.740	10		27.300	1.0000
6.25	25.900	0.9487	25.900	20,000	30.000		10			
12.5	9.900	0.3626	9.900	3.000	23,000		10		25.900	0.9487
25	0.700	0.0256	0.700	0.000	3.000	151.336	10		9.900	0.3626
50	3.200	0.1172	3.200	0.000	13.000			9	2.433	0.0891
100	3.400	0.1245	3.400		1,1-1,1-1	120.402	10		2.433	0.0891
100	0.400	0.1243	3.400	0.000	10.000	88.995	10		2.433	0.0891

Auxiliary Tests	Statistic	Critical	Skew Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.18438	0.895	1.5425 5.17525
Bartlett's Test indicates unequal variances (p = 1.36E-04)	25.0577	15.0863	110 120 0.17320
Linear Interpolation	(200 Resamples)		

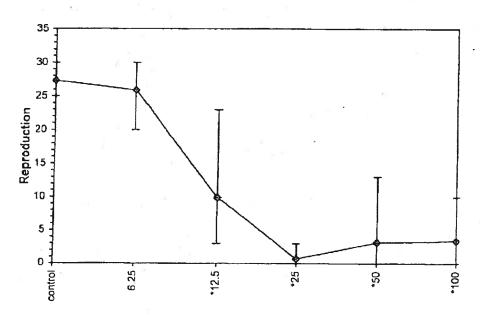
				Lille	ar interpol
Point	%%	SD	95%	CL	Skew
IC05*	6.094	1.401	2.799	6:792	-0.5756
1C10	6.770	0.471	5.599	7.340	-1.8814
IC15	7.303	0.338	6.712	7.884	-0.1234
IC20	7.836	0.336	7.293	8.459	0.0686
IC25	8.369	0.346	7.813	9.028	0.2756
IC40	9.969	0.435	9.332	11.032	0.6789
IC50	11.035	0.530	10.258	12.355	0.8244
* indicates IC	actimate less	thou the			

indicates IC estimate less than the lowest concentration



Ceriodaphnia Survival and Reproduction Test-Reproduction											
Start Date:	5/8/2012		12-07090	Sample ID:	12-07090						
End Date:	5/15/2012	Lab ID:	JRR	Sample Type:	EFF2-Industrial						
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002		CD-Ceriodaphnia dubia						
Comments:				)							

Dose-Response Plot





Chronic Pimephales promelas Larval Survival and Growth Test

JRA# 12-07090

#### PHYSICAL/CHEMICAL DATA

CONC: Control		DAY 0	DAY 1	DAY 2	DAY3	DAY4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24,1	24.7	24.1	24,2	24,	24,	24.1	N/A
	END	N/A	25/3	25:3	25.3	25.2	24.9	24.9	25,4
pH	NEW	7.98	7.95	8.03	7.97	7.95	8.18	8.10	N/A
	END	N/A	7.43	7.36	7.05	1.24	7.44	7.38	7.46
DO (mg/L)	NEW	8.3	8,1	8.2	8.	8.2	8.1	8.3	N/A
	END	N/A	6.8	5-8	5.6	5-8	6.0	5.5	6.7
COND (µmhos/	cm)	176	172	171	170	171	170	171	N/A
DATE		5/8/12	5/9/12	5/10/12	5/11/12	5/12/12	3/13/12	514/12	5/5/1
INITIALS		Ku	Ku	Vu .	per	cu	Ry	Ku	Ru

CONC: 6.25%		DAYO	DAY1	DAY2	DAY3	DAY 4	DAY 5	DAY 6	DAY7
TEMP (°C)	NEW	24.1	24, ]	24.2	24.2	24,1	24.1	24.1	N/A
.,	END	N/A	25.3	25.3	25:3	25,2	24.9	24.9	25.4
pH	NEW	7.89	7.88	7.85	7.83	7.91	8.13	8.13	N/A
	END	N/A	7.33	7.05	6.94	7.16	7.30	7.23	7.30
DO (mg/L)	NEW	8.2	8.3	8.1	8,1	8.2	8-2	8.3	N/A
	END	N/A	6.0	2-3	5.0	5.5	5.8	5.0	6.2
COND (µmho	s/cm)	175	170	170	169	169	168	167	N/A

CONC: 12.5%		DAYO	DAY 1	DAY2	EYAD	DAY4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24.2	24.]	24,4	24,3	24,1	24,1	24.1	N/A
······································	END	N/A	25.3	25.3	25.3	25.2	249	249	25.4
pH	NEW	7.83	7.85	7.77	774	7-87	8.01	8.eX	N/A
	END	N/A	7.27	4-99	6.41	7.06	7:11	7,10	7.28
DO (mg/L)	NEW	2.1	8.1	8.1	8.0	8.2	8:0	8-2	N/A
	END	N/A	5.7	5.2	5.0	5.2	5.3	4.6	6.1
COND (umbo	s/cm)	174	168	169	168	168	167	166	N/A



Chronic Pimephales promelas Larval Survival and Growth Test

JRA#12-07090

#### PHYSICAL/CHEMICAL DATA

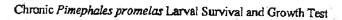
NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001

ONC: 25%		DAYO	DAYI	DAY2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
TEMP .(°C)	NEW	243	24.5	24,5	24.4	24.2	24,2	241	N/A
	END	N/A	25.3	25.3	25.3	25,2	24.9	24.9	2514
рН	NEW	7.78	7.79	7.69	7.66	7.69	7.96	8.01	NA
	END	N/A	7.21	6.87	6.80	6.86	7.09	6.99	7.13
DO (mg/L)	NEW	8.1	8.1	8.1	8.0	8.2	8,0	8,)	N/A
	END	N/A	5.5	5.2	4.6	5.0	5.1	4.6	5.7
cond (mail)	/cm)	171	167	168	166	166	164	(63	N/A
DATE		58112	519112	2/10/15	5/11/12	5/12/12	5/13/12	5/14/17	- 5/15/
INITIALS		E.	Jen	reu	pu	ku	Ku	len	Ku

CONC: 50%		DAYO	DAY 1	DAY 2	DAY3	DAY4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24.3	24.5	24.8	24.4	24,2	242	24.	N/A
	END	N/A	26.3	25.3	25.3	25,2	24.9	24.9	25.4
рH	NEW	7.71	7.72	7.58	751	7.51	7.87	7.88	N/A
	END	N/A	7.14	6.36	6.73	6.93	6.96	6-87	7.06
DO (mg/L)	NEW	8.(	8.0	8.1	8-1	8.2	8,0	8:1	N/A
	END	N/A	5.5	5.2	4.7	4.9	4.9	4.8	5.7
COND (umhos/cr	<b>2</b> )	165	163	164	160	160	159	158	N/A

CONC: 100%	2 2	DAYO	DAYI	DAY 2	DAY 3	DAY 4	DAY 5	DAY6	DAY 7
TEMP (°C)	NEW	24.7	25.1	24.6	25.0	25.0	246	25.0	NA
	END	N/A	25.3	25.3	25.3	25.2	249	24.9	25,14
рН	NEW	7.24	7.48	7.35	7.22	7.40	7.54	7.60	NA
	END	N/A	7.03	4.79	6.53	6.60	6.80	6-64	6.88
DO (mg/L)	NEW	8.4	8.2	8.3	8.4	8.3	8,2	8.2	N/A
	END	N/A	6.1	5.4	4.5	4.8	4.5	4.6	519
COND (µmbos	(cm)	156	128	155	121	151	150	151	N/A

JRA# 12-07090



#### **OBSERVATIONS**

NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001

ORGANISM SOURCE: Chesapeake Cultures JRA BATCH #: 7435 HATCH DATE: 1401-160

		7		UMBER SURVI		1 11 - 1 <u>-</u>	11	ATCH D	AIE: 1
CONC	REF	DAY			DAY 3	DAY	DAY 5	DAY 6	DAY:
	Α	10	10	10	10	10	10	10	1.0
Control	В	10	10	10	10	10	-	10	(0
	c	10	10	10	10	10	10	[0	10
X suv 100 %	D	10	10	10	10	10	10	10	10
	A	10	10	1,0	10	10	10	10	10
6.25%	В	10	10	10	10	10	[0	10	10
0	С	10	[0	0)	ID	10	(0	10	10
x suv 975%	D	10	10	10	10	10	9	9	9
	A	10	10	10	10	10	10	10	10
12,5%	В	10	10	10	10	(t	10	10	LC
2-	С	10	9	9	9	9	9	9	9
X strv 95%	D	10	9	9	9	G	9	9	9
	A	10	10	10	10	10	9	19	9
25%	В	10	10	10	10	10	10	10	10
x suv 975	С	10	10	10	10	10	10	10	10
X suv V/J %	Q Q	10	10	10	10	10	10	10	10
	_ A	10	10	10	9	9	9	9	7
	В	10	10	10	10	10	10	10	9
0% a. ~	С	10	10	10	10	10	10	10	10
x 844 925%	D	10	10	10	10	10	10	9	9
inh.	^	10	10	10	10	9	9	9	9
	В	10	10	10	10	10	10	10	lo
92.5	C	10	10	9	9	9	9	9	9
surv 125 %	D	10	9	9	9	9	9	9	q
DATE			519/12	5/10/12	\$11/12	6/12/12	5/13/12	5/14/2	1/2/12
TIME		1115	1000	1050	1115	1045	1050	1000	1015
TIM		1km	En	Eu !	bis	laul	bas	ar	pur



Chronic Pimephales promelas Larval Survival and Growth Test

JRA# 12-07080

#### WATER QUALITY

NPDES#: VA0001872 CLIENT: Fairfax Terminal Complex OUTFALL: 001

	SAMPLE (PRIOR TO RENEWALS)												
DATE	DAY	COLLECTION DATE/TIME	ARRIVAL DATE	TEMP (°C)	INIT pH	FINAL pH (6 - 9)	INIT DO (mg/L)	FINAL DO (rog/L)	COND (µmhos)	INIT TRC (mg/L)	FINAL TRC (mg/L)	HARD (mg/L)	ALK (mg/L)
5/8/12	0	5/6/12 1600	5/8/12	24.7	6-73	7.24	9.7	8.4	156	2002	~	*2	29
5/9/12	1	45	1.0	250	6.83	7.48	10.2	8.2	158	<0.02		4	19
5/10/12	2	518112 1030	5/10/12		1	7-35	9,6	8,3	155	<0:0Z	1	4	30
5/11/12	3	5(4/12 1035	5/11/12	25,0	6.92	7.22	95	8.4	151	<0:07	-	41	30
5/12/12	. 4	1	• • •	25.0	6.77	7.40	10-0	83	151	<0.02	1	41	30
5113/12	5	11	4 (	_	7.05		10-6	8.2	150	<> 40 €	_	41	30
5/14/12	6	( 4	e, e	25.0	6,91	7-60	107	8-2	15]	<0.0L	-	41	90

DO Adjustments	Date Method Minutes	5/8/12 5/9/12 5/10/12 5/11/12 5/13/12 5/13/12 5/14/12  Aerise perise perise herve perise perise 10 15 15 10 15 15 15
pH Adjustments	Date Method Amount	
TRC Adjustments	Date Method Amount	

		DILUENT (DMW)	Mod Hard SFW	Other		) CI	RCLE ONE		
DATE	DAY	DATE MADE	TEMP (°C)	рН	DO (mg/L)	COND (µmhos)	TRC (mg/L)	HARD (mg/L)	ALK (mg/L)
5/8/12	0	5 5 12	24.1	7.98	8.3	176	602	Sp	61
5/9/12	1	5/6/12	24.7	7.95	8.1	172	20,02	\$1	64
5/10/12	2	5/7/12	24,1	8103	8.2	171	20.02	83	Cot
5/11/12	3 7	5/8/12	24.2	7.97	8:1	170	20102	83	G.K
5/12/12	4	519112	24.	7.95	8.2	171	20.02	82	64
5/13/12	5	5/10/12	24.1	8.18	8.1	170	20102	28	63
5/14/12	6	5/11/12	24.1	8,10	8.3	171	2002	82	6X

Chronic P.promelas Survival and Growth Test

JRA:

12-07090

NPDS# VA0001872 **CLIENT:** Fairfax Terminal Complex **GROWTH DATA** 

OUTFALL#\_\_\_ 001

REP	FOIL#	FOIL WT(mg)	FOIL WT&ORG WT(mg)	WT OF ORGS(mg)	#ORGS	MEAN		
+						<u> </u>		
	ЗН	4.411		L		4		viving
D	4H	5.493						0.91
-		1	• /				over ut :	0.01
							ave. wt.	0.91
^	5H	1.457	12.065	9.509	10	0.951		
	1							
D	8H	4.691	13.269	8.578	10			
							aug ud	0.96
A	9H	4 441	12 860	8 428	10	0 843		0.86
					I			<del></del>
	12H	4.617	13.568	8.951	10	0.895		
							ave. wt ;	0.877
Α	13H	4.620	13.126	8.506	10	0.851		
	14H	4.193	13.349	9.156	10	0.916		
					10			
	16H	4.601	13.840	9.239	10	0.924		
						·		
							ave. wt	0.896
				8.069	10	0.807		
	2011	4.017	11.759	7,142	10	0.714		
+				'				٠
							ave. wt :	0.772
		4.8	12.741	7.941	10	0.794		
, 2	24H	4.018	12.637	8.019	10	0.802		
-					7			
ate		5/10/2012	5/16/2012				ave, wt :	0.772
	A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C D A B C	A 1H B 2H C 3H D 4H A 5H B 6H C 7H D 8H C 7H D 12H A 13H B 14H C 15H D 16H C 15H D 16H C 19H D 20H A 21H B 22H C 23H	A 1H 4.748 B 2H 4.533 C 3H 4.411 D 4H 5.493 A 5H 4.397 C 7H 4.129 D 8H 4.691 A 9H 4.441 B 10H 4.549 C 11H 4.377 D 12H 4.617 A 13H 4.620 B 14H 4.193 C 15H 4.610 D 16H 4.601 A 17H 4.440 B 18H 4.227 C 19H 4.725 D 20H 4.617	A 1H 4.748 13.807 B 2H 4.533 13.595 C 3H 4.411 13.731 D 4H 5.493 14.690  A 5H 4.457 12.965 B 6H 4.397 13.281 C 7H 4.129 12.772 D 8H 4.691 13.269  A 9H 4.441 12.869 B 10H 4.549 13.569 C 11H 4.377 13.075 D 12H 4.617 13.568  A 13H 4.620 13.126 B 14H 4.193 13.349 C 15H 4.610 13.55 D 16H 4.601 13.840  A 17H 4.440 12.509 B 18H 4.227 11.682 C 19H 4.725 12.949 D 20H 4.617 11.759 C 23H 4.8 12.741 C 21H 4.8 12.741 C 22H 4.190 11.879 C 23H 4.457 11.698	A	A 1H 4.748 13.807 9.059 10 B 2H 4.533 13.595 9.062 10 C 3H 4.411 13.731 9.32 10 D 4H 5.493 14.690 9.197 10  A 5H 4.457 12.965 8.508 10 B 6H 4.397 13.281 8.884 10 C 7H 4.129 12.772 8.643 10 D 8H 4.691 13.269 8.578 10  A 9H 4.441 12.869 8.428 10 C 11H 4.377 13.075 8.698 10 D 12H 4.617 13.558 9.9020 10 C 11H 4.379 13.558 9.9020 10 C 15H 4.610 13.55 8.940 10 D 16H 4.601 13.840 9.239 10 D 16H 4.601 13.840 9.239 10 D 16H 4.617 11.682 7.455 10 D 20H 4.617 11.759 7.142 10 D 20H 4.617 11.759 7.142 10	A 1H 4.748 13.807 9.055 10 0.906 B 2 H 4.533 13.595 9.062 10 0.906 C 3H 4.411 13.731 9.32 10 0.932 D 4H 5.493 14.690 9.197 10 0.920 D 6 D 6 D 6 D 6 D 6 D 6 D 6 D 6 D 6 D	A

Date/Time in Oven	_5/15/12@1100_	Analyst	KH
Date/Time out of Oven !	5/16/12@0700	Analyst	LD

Oven Temp <sup>0</sup> C	_104	
Oven Temp <sup>0</sup> C	104	



### Chronic Pimephales promelas Larval Survival and Growth Test

JRA#12-07090

GENERAL COMMENTS	

DES#: VA0	001872 CLIE	NT: Fair	fax Terminal (	Complex		01	UTFALL: 00
FEEDINGS	DAYO	DAYI	DAY 2	DAY3	DAY 4	DAY 5	DAY 6
DATE/TIME		519/12	5/10/12	5/11/12	5/12/12	5/13/12	3/14/12
INITIALS		Ken	ten	ku.	Ku	Ven	Ver
DATE/TIME	518112	519/12	5/10/12	5/11/12	1230	1205	1230
INITIALS	Ku	len	ku	len	len	ku	len

	TREAT	IMENT PREPARA	TIONS CAL		Verification of:	Verified by:	ANALYST SIGNATURES	INITIALS		
Conc. (%) (circle one)	Total Volume (mL)	Stock Cono. (%)	Amount Stock (mL)	Amount Diluent (ml.)	Hand (mg/L)	ALK (mg/L)	Treatment Preparation Calculations	4	19	Ly
Control	1200	NA 4 Sell	0	1200	8-88	62-64	Number of Organisms	4		
6.25%	1200	105%	75 .	1125			Statistical Analyses	4		
12.5%	1200	100%	150	1050			Statistical Analyses	4		
25%	1200	100%	300	900						
50%	1200	100%	600	600					Kenim	Kul
100%	1200	100%	1200	0	4146	29-30				
Stock Solution		a								

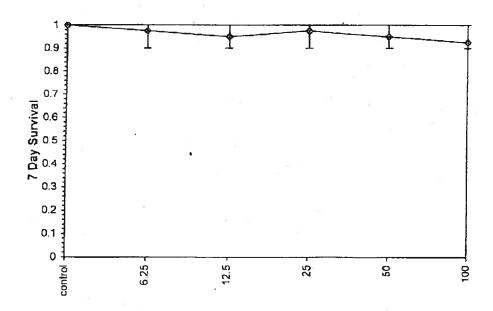
TEST CHAMBER SIZE: 500ml	TYPE:	Polystyrene	VOLUME OF TEST SOLUTION:_	250mL	
COMMENTS:					
					a 5:
10		A			
					•
	7.5				
			· · · · · · · · · · · · · · · · · · ·		
	<del></del>				

			La	rval Fish Gr	owth and Surviv	val Test-7 Day Si	urvival	
Start Date:	5/8/2012		Test ID:	12-07090		Sample ID:	12-07090	
End Date:	5/15/2012		Lab ID:	JRR		Sample Type:	EFF2-Industria	al
Sample Date:			Protocol:	EPAF 94-E	PA/600/4-91/002	Test Species:	PP-Pimephale	s promelas
Comments:								
Conc-%	1	2	3	4		5		
control	1.0000	1.0000	1.0000	1.0000				
6.25	1.0000	1.0000	1.0000	0.9000	= 5			
12.5	1.0000	1.0000	0.9000	0.9000				
25	0.9000	1.0000	1.0000	1.0000				
50	0.9000	1.0000	1.0000	0.9000				
100	0.9000	1.0000	0.9000	0.9000				

	 1-Tailed	Rank		uare Root	Arcsin Sq	ansform:	Tra			
63	Critical	Sum	N	CV%	Max	Min	Mean	N-Mean	Mean	Conc-%
			4	0.000	1.4120	1.4120	1.4120	1.0000	1.0000	control
	10.00	16.00	4	5.942	1.4120	1.2490	1.3713	0.9750	0.9750	6.25
	10.00	14.00	4	7.072	1.4120	1.2490	1.3305	0.9500	0.9500	12.5
	10.00	16.00	4	5.942	1.4120	1.2490	1.3713	0.9750	0.9750	25
	10.00	14.00	4	7.072	1.4120	1.2490	1.3305	0.9500	0.9500	50
	10.00	12.00	4	6.318	1.4120	1.2490	1.2898	0.9250	0.9250	100

Auxiliary Tests	0				Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates no	ution (p > 0		0.93836	0.916	-0.2239	-0.9803		
Equality of variance cannot be co	onfirmed	•						
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU				
Steel's Many-One Rank Test	100	>100		1				
Treatments vs control								

Dose-Response Plot

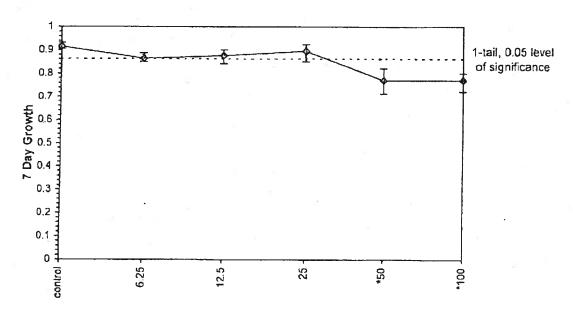


			La		wth and Survi	val Test-7 Day G	rowth			
Start Date:	5/8/2012		Test ID:	12-07090		Sample ID:	12-070	90		P 1
End Date:	5/15/2012		Lab ID:	JRR		Sample Type:	EFF2-1	ndustrial		
Sample Date:			Protocol:	EPAF 94-EPA	1/600/4-91/002	Test Species:	PP-Pin	nephales pr	omelas	
Comments:	25	==	12.0			i		8		
Conc-%	1	2	. 3	4						
control	0.9059	0.9062	0.9320	0.9197	211					
6.25	0.8508	0.8884	0.8643	0.8578						
- 12.5	0.8428	0.9020	0.8698	0.8951						
25	0.8506	0.9156	0.8940	0.9239						
50	0.8069	0.7455	0.8224	0.7142	1 8					
100	0.7941	0.7689	0.7241	0.8019						

		_		Transform	n: Untran	sformed			1-Tailed	100	•
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	
control	0,9160	1.0000	0.9160	0.9059	0.9320	1.363	4		i "		, S
6.25	0.8653	0.9447	0.8653	0.8508	0.8884	1,888	4	2,254	2.410	0.0541	
12.5	0.8774	0.9579	0.8774	0.8428	0.9020	3.068	4	1.715	2.410	0.0541	
25	0.8960	0.9782	0.8960	0.8506	0.9239	3,661	4	0.887	2,410	0.0541	
*50	0.7723	0.8431	0.7723	0.7142	0.8224	6.603	4	6.399	2.410	0.0541	
*100	0.7723	0.8431	0.7723	0.7241	0.8019	4.539	4	6.399	2,410	0.0541	

Auxiliary Tests			Statistic		Critical		Skew	Kurt		
Shapiro-Wilk's Test indicates normal distribution (p > 0.05) Bartlett's Test indicates equal variances (p = 0.29)					0.96171	······································	0.916	6 -0		-0.4145
					6.15745	5 15.0863				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	25	50	35.3553	4	0.05412	0.05909	0.01564	0.00101	5.6E-06	5, 18
reatments vs control					*					

#### Dose-Response Plot

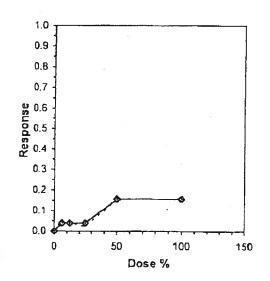


			La	rval Fish G	rowth and Surviv	val Test-7 Day G	rowth	
Start Date:	5/8/2012		Test ID:	12-07090		Sample ID:	12-07090	
End Date:	5/15/2012		Lab ID:	JRR		Sample Type:	EFF2-Industrial	
Sample Date:			Protocol:	EPAF 94-E	PA/600/4-91/002	Test Species:	PP-Pimephales promelas	
Comments:	_	198						
Сопс-%	1	2	3	4				
control	0.9059	0.9062	0.9320	0.9197				
6.25	0.8508	0.8884	0.8643	0.8578				
12.5	0.8428	0.9020	0.8698	0.8951				
25	0.8506	0.9156	0.8940	0.9239				
50	0.8069	0.7455	0.8224	0.7142				
100	0.7941	0.7689	0.7241	0.8019				

Transform: Untransformed								· · · · · · · · · · · · · · · · · · ·	 Isot	onic
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N		Mean	N-Mean
control	0.9160	1.0000	0.9160	0.9059	0.9320	1.363	4		0.9160	1.0000
6.25	0.8653	0.9447	0.8653	0.8508	0.8884	1.888	4_		0.8796	0.9603
12.5	0.8774	0.9579	0.8774	0.8428	0.9020	3.068	4		0.8796	0.9603
25	0.8960	0.9782	0.8960	0.8506	0.9239	3.661	4		0.8796	0.9603
50	0.7723	0.8431	0.7723	0.7142	0.8224	6.603	4		0.7723	0.8431
100	0.7723	0.8431	0.7723	0.7241	0.8019	4.539	4		0.7723	0.8431

Auxiliary Tests		Statistic	Critical -		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.96171	0.916	27.	-0.422	-0.4145
Bartlett's Test indicates equal variances (p = 0.29)	30	6.15745	15.0863			

Linear Interpolation (200 Resamples) Point % SD 95% CL(Exp) Skew IC05 27.198 6.385 0.000 32.948 -2.4303 IC10 37.865 2.861 32.559 50.256 0.8033 IC15 48.531 IC20 >100 >100 IC25 IC40 >100 IC50 >100



Larval Fish Growth and Survival Test-7 Day Growth

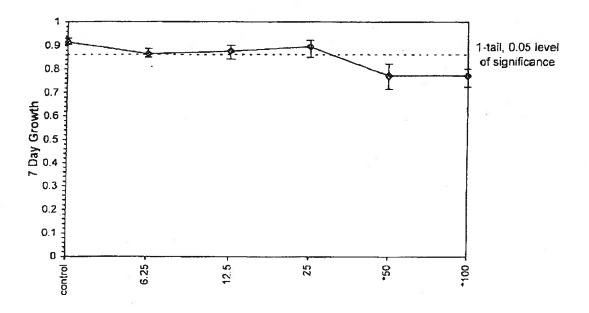
Start Date: 5/8/2012 Test ID: 12-07090 Sample ID: 12-07090

End Date: 5/15/2012 Lab ID: JRR Sample Type: EFF2-Industrial

Sample Date: Protocol: EPAF 94-EPA/600/4-91/002 Test Species: PP-Pimephales promelas

Comments:

Dose-Response Plot





# Toxicity Test Sample Chain of Custody



PLEASE COMPLETE ALL INFO		
Facility: <u>Fairfax Termina</u>	U JBC	
NPDES#: VAOODI872		
	e Fair-fax VAZZ	03/
County: Fair-fax		
Flow Type (Circle One): Continuous) Interm		
		el. 75 00 j
Instream Waste Conc		
Type of sample:		
(Grab): Date Time _	Amount of Sample (	Collected
(Time Composite): Collected from (		
To (Date/Time):	5/7/12/0960	
Number/Volume of Subsamples:	Time Increment: 1hr	Total Amount Collected: 5 gallon S
(Flow-Proportional Composite: ): Co	llected from (Date/Time):	
	To (Date/Time):	
Set Volume Subsample/Volume Flo	w: Total Amo	ount Collected:
For variable volume subsamples based on flow	v/set time Increments Attach same	ple and flow information.
Sample collected by: (print) LINGSAY PIC	rie Affiliation: 112	\$
(sign)	)	
*Temperature of sample in sample collection of	evice 3.5°C	
*Final temperature of effluent at sample collec	tion point 18.5°C	
*Is sample collection device chilled? Yes	Is sample packed on ice for shipm	nent? Ve S
*It is required that all samples remain at 0-	C during collection period and s	shipment for data to be accented
by the appropriate Regulatory Agency ( Do	not freeze!)	mipment for data to be accepted
Is the sample chlorinated? <u>No</u> dechloring	ted? No If so how?	
Permit with interim chlorine limit? No If	ves_limit/ma/()	
Field pH 6.63 Field Total Residual Chloris	reconditional Times 00.20	C-h ti-n 0070
Name of Analyst. I inde at Pierre	AGG!::::::	Grab time: <u>0930</u>
Name of Analyst: //ndsay Pierre	Allination: UE	
Comments/Sample description wastewat	a istarri Woder	
Method of Shipment: Fed Ex Shipment Date / Time: 5/7/12 / 12	200	
Type of test(s) to be performed: Chronic	( 1. 6)	
(Specific organisms).	C. alesta	
(Specify organisms): Chronic	P. promeias	
PRINT & SIGN NAMES	# B .	± =
Relinquished by: (Print) Lindsay Plent	2 15: 4	
Received by: (Print)	/Sign Joseph	Date/Time 5/7-/12/1200
Received by: (Film.)	/Sign_/	Date/Time
Delin anished law (D. L. A. Y. / D. C.		
Relinquished by: (Print) Fied by	/Sign	Date/Time
Received by: (Print) mudy bull	/Sign Mendy hall	Date/Time 5-812 0 09:20
	<i>F</i> .	
Relinquished by: (Print)	/Sign	Date/Time
Received by: (Print_)	/Sign_	Date/Time
EFFI HEND CONDUCT		
TRA # 12 nd	ON UPON ARRIVAL AT LABO	DRATORY
JRA#: 120100 A Arrival Temperature:	Date : 5-8-12 Time	e: <u>04: 20</u> Ice Present: <u>Yes / No</u>
bampie voidine. 25 Gall Color, Light biv	JOC: himse Solids' Come of	$H \cdot I \cdot $
Conductivity (minios/citi) 15 0 (a) 14.	_ C Salimity (ppt ): <   TF	C (mg/L): < 0.02
Method (For TRC): HACH 8167 Anal	yst: gu	





# Toxicity Test Sample Chain of Custody PLEASE COMPLETE ALL INFORMATION

Facility: Fair-tax Termina	TBC	ar .
NPDES#: <u>VACOO1872</u>		
Address: 91001 Colonial Ave	Fairfax VA 2203	
County: Fair-tax	Pipe/Outfall/Location:	PS-001
Flow Type (Circle One): Continuous) Intermit	tent Batch Stormwater Othe	π:
Instream Waste Conc	* 2	
Type of sample:		n =
(Grab): Date Time	Amount of Sample C	ollected
(Time Composite): Collected from (D		30
To (Date/Time):	5/9/12 / 0	930
Number/Volume of Subsamples:	Time Increment: WV	Total Amount Collected: 5 and 100 C
(Flow-Proportional Composite: ): Coll	ected from (Date/Time):	
	To (Date/Time):	
Set Volume Subsample/Volume Flow	Total Amou	unt Collected:
For variable volume subsamples based on flow	set time Increments Attach samp	le and flow information.
Sample collected by: (print) Lindsay Pic	Me Affiliation: UR	S
(sign) Organia		d.
*Temperature of sample in sample collection de	vice 3.4°C	
*Final temperature of effluent at sample collection	on point <u>20.7°C</u>	
*Is sample collection device chilled? Ves	Is sample packed on ice for shipme	ent? Yes
*It is required that all samples remain at 0-6°	C during collection period and sl	hipment for data to be accepted
by the appropriate Regulatory Agency (Do 1	not freeze!)	• • • • • • • • • • • • • • • • • • •
Is the sample chlorinated? No dechlorinate	ed? No If so, how?	
Permit with interim chlorine limit? No If y	res- limit (mg/L)	for the second s
Field pH 7.4 Field Total Residual Chlorine Name of Analyst: Lindsay Pierre	0.68mg/L Time: 0940	Grab time: 094()
Name of Analyst: Lindsay Pierre		
Comments/Sample description · Waste Wate	r /Starm Water	1.39
Method of Shipment: Fed EX Shipment Date / Time: 5/9/12 / 120		
Shipment Date / Time: 5/9/12 / 120	00	722 (90)
Type of test(s) to be performed: Chronic	C. dubia	
(Specify organisms): Chronic	P. promulas.	
DOTNER & STANTANDO		
PRINT & SIGN NAMES	(A) 6 -	
Relinquished by: (Print) folsay Plene	/Sign forces	Date/Time 5/9/12/1200
Received by: (Print_)	/Sign /	Date/Time
Relinquished by: (Print) Fad by	<b>10</b> 3	
	_/Sign_	_Date/Time
Received by: (Print) Mudy hall	/Sign-mendylall	Date/Time 5-107209:15
Dalin switched how (Direct)		ar .
Relinquished by: (Print)	_/Sign	
Received by: (Print_)	/Sign_	Date/Time
EFFLUENT CONDITION	ON UPON ARRIVAL AT LABO	DATODY
JRA#: 120709613 Arrival Temperature: 1.	2- C Date · Elal : Time	Too Brosom War All
Sample Volume: 2.5 Gul Color: Light bray	lor: Name Solide: Some of	100 (max) \ 100
Conductivity (µmhos/cm) 15.5 @ 24.6		
Method (For TRC): HACH 8167 Analy	et. V	C (mg/L): <a></a> <a><a></a> <a></a> <a></a> <a></a> <a><a></a> <a><a><a><a><a><a><a><a><a><a><a><a><a>&lt;</a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>
rinary.	st:	



# # 2 coolers in shipment



# Toxicity Test Sample Chain of Custody PLEASE COMPLETE ALL INFORMATION

	JRC	
NPDES#: VAOCO1872		
Address: 91001 Colonial Ave	Fairfax VA 220	3
County: Fairfax		
Flow Type (Circle One): Continuous) Interm		Other:
Instream Waste Conc		
Type of sample:(Grab): Date Time	A	Ja Callanda I
(Grab): Date Time (Time Composite): Collected from (I	Date/Time): 5/6/13	ole Collected
To (Date/Time):	· 5/10/15/1	0020
Number/Volume of Subsamples:	74 Time Increment:	hr Total Amount Collected: Sactions
(Flow-Proportional Composite: ): Co	ollected from (Date/Time):	TOTAL TOTAL SOLIDOWN. SOLIDOWN.
	To (Date/Time):	
Set Volume Subsample/Volume Flo	w: Total A	amount Collected:
For variable volume subsamples based on flow	w/set time Increments Attach s	ample and flow information
Sample collected by: (print) Lindsay Pie	evre Affiliation:	ULS
(sign) Vob. ///>		
*Temperature of sample in sample collection d	levice 3.3°C	
*Final temperature of effluent at sample collect	tion point 8.8°C	
*Is sample collection device chilled? \estimate S	_ Is sample packed on ice for sh	ipment? Ves
*It is required that all samples remain at 0-6 by the appropriate Regulatory Agency ( Do	Couring collection period ar	nd shipment for data to be accepted
Is the sample chlorinated? No dechlorina	ted? A/A If so how?	
Permit with interim chlorine limit? No If	wee_limit (ma/L)	
Field pH 7.56 Field Total Residual Chlorin	ne () 17 mg// Time: (301 C	Grah time: 091 C
Name of Analyst: Indsay Pierre	Affiliation: 11	P C
Comments/Sample description ' 1///(///	Vator / Cham under	
Comments/Sample description ' 1///(///	Vator / Cham under	
Method of Shipment: Fed EX  Shipment Date / Time: 57/10/12   12	Nater   Starm water	
Method of Shipment: Fed EX Shipment Date / Time: 5/10/12 / 12 Type of test(s) to be performed: Chirolic	Nater   Storm water 200 C. dubia	
Method of Shipment: Fed EX  Shipment Date / Time: 57/10/12   12	Nater   Storm water 200 C. dubia	— 100
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12   12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic	Nater   Storm water 200 C. dubia	
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12 / 12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES	Nater   Storm water 200 - C. dubia - P. promelas	
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12   12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES Relinquished by: (Print) Lindsay Piene	Vater / Storm water 200 C. dubia P. framelas ISign Group	
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12 / 12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES	Nater   Storm water 200 - C. dubia - P. promelas	
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12 / 12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES Relinquished by: (Print) Lindsay Piene Received by: (Print)	Nater   Starm water 200 C. dubid P. promelas  /Sign Jacoupt	Date/Time 5/10/12/1200 Date/Time
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12 12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic (Specify organisms): Chronic Relinquished by: (Print) Lindsay Piene Received by: (Print)	Vater   Storm water 200  C. dubia P. promelas  /Sign / Joseph / Sign / Sign	
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12 / 12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES Relinquished by: (Print) Lindsay Piene Received by: (Print)	Nater   Starm water 200 C. dubid P. promelas  /Sign Jacoupt	Date/Time 5/10/12/1200 Date/Time
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12 / 12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES Relinquished by: (Print) Lindsay Piene Received by: (Print) Feel Gy Received by: (Print) Feel Gy Received by: (Print) Mandy hall	Vater / Starm water 200  C. dubid P. promelas  /Sign forces /Sign /Sign /Sign Mendy hall	Date/Time 5/10/12/12/00 Date/Time  Date/Time  Date/Time  Date/Time  Date/Time
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12 12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic (Specify organisms): Chronic Relinquished by: (Print) Lindsay Piene Received by: (Print)	Vater   Starm water 200  C. dubid P. Pranelas  /Sign / Jacquer /Sign / Sign /Sign Mendy hall /Sign	Date/Time 5/10/12/1200 Date/Time Date/Time Date/Time Date/Time Date/Time
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12 12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES Relinquished by: (Print) Lindsay Piene Received by: (Print) Relinquished by: (Print) Received by: (Print) Relinquished by: (Print) Relinquished by: (Print)	Vater / Starm water 200  C. dubid P. promelas  /Sign forces /Sign /Sign /Sign Mendy hall	Date/Time 5/10/12/12/00 Date/Time  Date/Time  Date/Time  Date/Time  Date/Time
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12   12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES Relinquished by: (Print) Lindsay Piene Received by: (Print)  Received by: (Print) Feel Gy Received by: (Print) Mendy hall  Relinquished by: (Print)  Received by: (Print)  Received by: (Print)	Vater   Starm water 200  C. dubid P. pranulas  /Sign facult /Sign /Sign /Sign /Sign /Sign /Sign	Date/Time  Date/Time  Date/Time  Date/Time  Date/Time  Date/Time  Date/Time  Date/Time
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12   12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES Relinquished by: (Print) Lindsay Piene Received by: (Print) Received by: (Print) Feel Gy Received by: (Print) Memoly hall Relinquished by: (Print) Received by: (Print) Received by: (Print)	Vater   Starm water  200  C. dubid P. pranulas  /Sign facust /Sign /Sign /Sign /Sign /Sign ON UPON ARRIVAL AT LA	Date/Time
Method of Shipment: FCd EX Shipment Date / Time: 5/10/12 / 12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES Relinquished by: (Print) Lindsay Piene Received by: (Print) Received by: (Print) Feel Gy Received by: (Print) Mandy hall  Relinquished by: (Print)  Received by: (Print)  EFFLUENT CONDITIONAL  FRA #: (207090C Arrival Temperature: 2000)	Storm water  200  C. dubid  P. promelas  /Sign forces  /Sign /Sign /Sign /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign	Date/Time
Method of Shipment: FCd EX Shipment Date / Time: 5/10/12   12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES Relinquished by: (Print) Lindsay Piene Received by: (Print) Received by: (Print) Feel Gy Received by: (Print) Feel Gy Received by: (Print) Received by: (Print)  EFFLUENT CONDITI JRA #: [207090C Arrival Temperature: 2 Sample Volume: 25 Get Color: Light browe	Storm water  200  C. dubid  P. promelas  /Sign forces  /Sign /Sign /Sign  /Sign  /Sign  /ON UPON ARRIVAL AT LA  1.6° Date: 5-11-12  Todor: None Solids: some	Date/Time
Method of Shipment: Fcd EX Shipment Date / Time: 5/10/12 12 Type of test(s) to be performed: Chronic (Specify organisms): Chronic (Specify organisms): Chronic (Specify organisms): Chronic  PRINT & SIGN NAMES Relinquished by: (Print) Lindsay Piene Received by: (Print)  Relinquished by: (Print)  Received by: (Print)  Received by: (Print)  EFFLUENT CONDITION  Sample Volume: 25 Get Color: Light brown  Conductivity (µmhos/cm) 151 @ 250	Storm water  200  C. dubid  P. promelas  /Sign forces  /Sign /Sign /Sign /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign  /Sign	Date/Time

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THE LEADER IN ENVIRONMENTAL TESTING

#### ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Nashville 2960 Foster Creighton Drive Nashville, TN 37204 Tel: (615)726-0177

TestAmerica Job ID: 490-42826-1 Client Project/Site: JBC Terminal

#### For:

ARCADIS U.S. Inc 1100 Welborne Drive Suite 100 Richmond, Virginia 23229

Attn: Sterling Turner

Jennifer Huckaba

Authorized for release by: 12/18/2013 4:34:44 PM

Jennifer Huckaba, Project Manager II (615)301-5042

jennifer.huckaba@testamericainc.com

·····LINKS ·······

Review your project results through

Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-1

## **Table of Contents**

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#### **Sample Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-42826-1	106	Water	12/16/13 13:15	12/17/13 09:00
490-42826-2	001	Water	12/16/13 15:20	12/17/13 09:00

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#### **Case Narrative**

Client: ARCADIS U.S. Inc

TestAmerica Job ID: 490-42826-1

Project/Site: JBC Terminal

Job ID: 490-42826-1

**Laboratory: TestAmerica Nashville** 

Narrative

Job Narrative 490-42826-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 12/17/2013 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 3.8° C and 5.5° C.

#### GC/MS VOA

Method(s) 8260B: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with batch 129873.

No other analytical or quality issues were noted.

#### GC Semi VOA

Method(s) 8015C: Insufficient sample volume was available to perform batch matrix spike/matrix spike duplicate (MS/MSD) associated with batch 129633.

Method(s) 8015C: The method blank for batch 129633 contained C10-C28 above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

No other analytical or quality issues were noted.

#### **General Chemistry**

No analytical or quality issues were noted.

#### **Organic Prep**

No analytical or quality issues were noted.

#### VOA Prep

No analytical or quality issues were noted.

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#### **Definitions/Glossary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-1

#### **Qualifiers**

#### **GC/MS VOA**

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

#### GC Semi VOA

Qualifier	Qualifier Description
В	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

#### **General Chemistry**

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

#### **Glossary**

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDΔ	Minimum detectable activity

DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDI	Method Detection Limit

MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated

ND Not detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control
RER Relative error ratio

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TestAmerica Nashville

#### **Client Sample Results**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal

Client Sample ID: 106

**General Chemistry** 

**Total Suspended Solids** 

TestAmerica Job ID: 490-42826-1

Lab Sample ID: 490-42826-1

Prepared

Analyzed

12/18/13 01:30

Matrix: Water

Date Collected: 12/16/13 13:15 Date Received: 12/17/13 09:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0	0.20	ug/L			12/18/13 15:10	1
Toluene	1.5		1.0	0.17	ug/L			12/18/13 15:10	1
Ethylbenzene	0.46	J	1.0	0.19	ug/L			12/18/13 15:10	1
Xylenes, Total	2.5	J	3.0	0.58	ug/L			12/18/13 15:10	1
Naphthalene	4.3	J	5.0	0.21	ug/L			12/18/13 15:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		70 - 130					12/18/13 15:10	1
4-Bromofluorobenzene (Surr)	100		70 - 130					12/18/13 15:10	1
Dibromofluoromethane (Surr)	100		70 - 130					12/18/13 15:10	1
Toluene-d8 (Surr)	96		70 - 130					12/18/13 15:10	1
- Method: 8015C - Nonhalogena	ted Organics usi	ng GC/FID ·	-Modified (Dies	el Range	Organics	s)			
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C28	2.3	В	0.098	0.027	mg/L		12/17/13 14:42	12/17/13 18:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	124	-	50 - 150				12/17/13 14:42	12/17/13 18:17	

RL

1.1

0.74 mg/L

Result Qualifier

4.1

TestAmerica Nashville

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Dil Fac

#### **Client Sample Results**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal

Client Sample ID: 001

TestAmerica Job ID: 490-42826-1

Lab Sample ID: 490-42826-2

Matrix: Water

Date Collected: 12/16/13 15:20 Date Received: 12/17/13 09:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
C10-C28	0.11	В	0.094	0.026	mg/L		12/17/13 14:42	12/17/13 18:32	
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	78		50 - 150				12/17/13 14:42	12/17/13 18:32	
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	1.4		1.0	0.70	mg/L			12/18/13 01:30	1

TestAmerica Job ID: 490-42826-1

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal

#### Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 490-129873/7

Matrix: Water

Analyte

Benzene

Toluene

Ethylbenzene

Xylenes, Total

Naphthalene

Analysis Batch: 129873

Client Sample ID: Method Blank Prep Type: Total/NA

MB MB Result Qualifier RL MDL Unit Dil Fac D Prepared Analyzed 1.0 1.0 U 0.20 ug/L 12/18/13 14:41 1.0 U 1.0 12/18/13 14:41 0.17 ug/L 1.0 U 1.0 0.19 ug/L 12/18/13 14:41 3.0 U 3.0 12/18/13 14:41 0.58 ug/L 5.0 U 5.0 0.21 ug/L 12/18/13 14:41

MB MB

	MD	MD					
Surrogate	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		70 - 130	<del>-</del>		12/18/13 14:41	1
4-Bromofluorobenzene (Surr)	100		70 - 130			12/18/13 14:41	1
Dibromofluoromethane (Surr)	99		70 - 130			12/18/13 14:41	1
Toluene-d8 (Surr)	95		70 - 130			12/18/13 14:41	1

Lab Sample ID: LCS 490-129873/3

Matrix: Water

**Analysis Batch: 129873** 

Client Sample ID: Lab Control Sample Prep Type: Total/NA

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Benzene	50.0	55.0		ug/L		110	80 - 121	
Toluene	50.0	54.6		ug/L		109	80 - 126	
Ethylbenzene	50.0	56.1		ug/L		112	80 - 130	
Xylenes, Total	100	110		ug/L		110	80 - 132	
Naphthalene	50.0	43.6		ug/L		87	62 - 138	

LCS LCS

Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	93		70 - 130
4-Bromofluorobenzene (Surr)	96		70 - 130
Dibromofluoromethane (Surr)	98		70 - 130
Toluene-d8 (Surr)	95		70 - 130

Lab Sample ID: LCSD 490-129873/4

Matrix: Water

Analysis Batch: 129873

Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	50.0	55.6		ug/L		111	80 - 121	1	17
Toluene	50.0	55.0		ug/L		110	80 - 126	1	15
Ethylbenzene	50.0	56.1		ug/L		112	80 - 130	0	15
Xylenes, Total	100	110		ug/L		110	80 - 132	0	15
Naphthalene	50.0	47.1		ug/L		94	62 - 138	8	26

LCSD LCSD

Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	94		70 - 130
4-Bromofluorobenzene (Surr)	95		70 - 130
Dibromofluoromethane (Surr)	97		70 - 130
Toluene-d8 (Surr)	95		70 - 130

TestAmerica Nashville

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12/18/2013

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-1

Client Sample ID: Lab Control Sample

46 - 132

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Type: Total/NA

57

Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Lab Sample ID: MB 490-129633/1-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA **Prep Batch: 129633** Analysis Batch: 129489

мв мв

RL MDL Unit Dil Fac Analyte Result Qualifier D Prepared Analyzed C10-C28 0.10 0.028 mg/L 12/17/13 14:42 12/17/13 17:47 0.0508 J

MB MB

Qualifier Limits Dil Fac Surrogate %Recovery Prepared Analyzed o-Terphenyl (Surr) 50 - 150 12/17/13 14:42 12/17/13 17:47 75

Lab Sample ID: LCS 490-129633/2-A

**Matrix: Water** Prep Type: Total/NA Analysis Batch: 129489 **Prep Batch: 129633** LCS LCS Spike Added Result Qualifier Analyte Limits Unit %Rec

0.566

mg/L

1.00

LCS LCS

Surrogate %Recovery Qualifier Limits 50 - 150 o-Terphenyl (Surr) 62

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 490-129738/1

**Matrix: Water** 

C10-C28

Analysis Batch: 129738

мв мв

MDL Unit Analyte Result Qualifier RL Prepared Analyzed Dil Fac 1.0 U 1.0 12/18/13 01:30 Total Suspended Solids 0.70 mg/L

Lab Sample ID: LCS 490-129738/2

**Matrix: Water** 

Analysis Batch: 129738

_		Spike	LCS	LCS				%Rec.	
Analyte		Added	Result	Qualifier	Unit	D	%Rec	Limits	
Total Suspended Solids		101	99.0		mg/L		98	90 - 110	

Lab Sample ID: 490-42823-C-1 DU

**Matrix: Water** 

Analysis Batch: 129738									
	Sample	Sample	DU	DU					RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D		RPD	Limit
Total Suspended Solids	4.6		 4.20	-	mg/L		 	9	20

TestAmerica Nashville

12/18/2013

**Client Sample ID: Duplicate** 

Prep Type: Total/NA

#### **QC Association Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-1

#### **GC/MS VOA**

#### Analysis Batch: 129873

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method Prep Batch
490-42826-1	106	Total/NA	Water	8260B
LCS 490-129873/3	Lab Control Sample	Total/NA	Water	8260B
LCSD 490-129873/4	Lab Control Sample Dup	Total/NA	Water	8260B
MB 490-129873/7	Method Blank	Total/NA	Water	8260B

#### GC Semi VOA

#### Analysis Batch: 129489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-42826-1	106	Total/NA	Water	8015C	129633
490-42826-2	001	Total/NA	Water	8015C	129633
LCS 490-129633/2-A	Lab Control Sample	Total/NA	Water	8015C	129633
MB 490-129633/1-A	Method Blank	Total/NA	Water	8015C	129633

#### **Prep Batch: 129633**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-42826-1	106	Total/NA	Water	3510C	
490-42826-2	001	Total/NA	Water	3510C	
LCS 490-129633/2-A	Lab Control Sample	Total/NA	Water	3510C	
MB 490-129633/1-A	Method Blank	Total/NA	Water	3510C	

#### **General Chemistry**

#### Analysis Batch: 129738

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-42823-C-1 DU	Duplicate	Total/NA	Water	SM 2540D	
490-42826-1	106	Total/NA	Water	SM 2540D	
490-42826-2	001	Total/NA	Water	SM 2540D	
LCS 490-129738/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 490-129738/1	Method Blank	Total/NA	Water	SM 2540D	

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#### **Lab Chronicle**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal

Client Sample ID: 106

TestAmerica Job ID: 490-42826-1

Lab Sample ID: 490-42826-1

Matrix: Water

Date Collected: 12/16/13 13:15 Date Received: 12/17/13 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	129873	12/18/13 15:10	BJM	TAL NSH
Total/NA	Prep	3510C			1020 mL	1 mL	129633	12/17/13 14:42	LSR	TAL NSH
Total/NA	Analysis	8015C		1	1020 mL	1 mL	129489	12/17/13 18:17	JML	TAL NSH
Total/NA	Analysis	SM 2540D		1	940 mL	1000 mL	129738	12/18/13 01:30	PHB	TAL NSH

Client Sample ID: 001 Lab Sample ID: 490-42826-2

Date Collected: 12/16/13 15:20 Matrix: Water

Date Received: 12/17/13 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1060 mL	1 mL	129633	12/17/13 14:42	LSR	TAL NSH
Total/NA	Analysis	8015C		1	1060 mL	1 mL	129489	12/17/13 18:32	JML	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	129738	12/18/13 01:30	PHB	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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#### **Method Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL NSH
8015C	Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)	SW846	TAL NSH
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL NSH

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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#### **Certification Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-1

#### **Laboratory: TestAmerica Nashville**

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	<b>Expiration Date</b>
Virginia	NELAP	3	460152	06-14-14

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#### **COOLER RECEIPT FORM**

Cooler Received/Opened On 12/17/2013 @ 900	
1. Tracking # <u>UDZ</u> (last 4 digits, FedEx)	
Courier:FedEx IR Gun ID17610176	
2. Temperature of rep. sample or temp blank when opened:	
3. If Item #2 temperature is $0^{\circ}$ C or less, was the representative sample or temp blank frozen?	YES NO NA
4. Were custody seals on outside of cooler?	YESNONA
If yes, how many and where:	
5. Were the seals intact, signed, and dated correctly?	YESNONA
6. Were custody papers inside cooler?	YES NO NA
I certify that I opened the cooler and answered questions 1-6 (intial)	
7. Were custody seals on containers:  YES (NO) and Intact	YESNO.
Were these signed and dated correctly?	YESNO.
8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Pape	r Other None
9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice	Other None
10. Did all containers arrive in good condition (unbroken)?	VESNONA
11. Were all container labels complete (#, date, signed, pres., etc)?	(ES)NONA
12. Did all container labels and tags agree with custody papers?	WES. NONA
13a. Were VOA vials received?	YES. (NO) NA
b. Was there any observable headspace present in any VOA vial?	YESNO.NA
14. Was there a Trip Blank in this cooler? YESNO. If multiple coolers, sequence	ce #
I certify that I unloaded the cooler and answered questions 7-14 (intial)	mom
15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level?	(ES).NONA
b. Did the bottle labels indicate that the correct preservatives were used	(YES)NONA
16. Was residual chlorine present?	YESNO(NA)
Lertify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial)	MDm
17. Were custody papers properly filled out (ink, signed, etc)?	ÆS).NONA
18. Did you sign the custody papers in the appropriate place?	YES)NONA
19. Were correct containers used for the analysis requested?	(FES)NONA
20. Was sufficient amount of sample sent in each container?	ESNONA
I certify that I entered this project into LIMS and answered questions 17-20 (intial)	mom
Lertify that I attached a label with the unique LIMS number to each container (intial)	more
21. Were there Non-Conformance issues at login? YESNo Was a NCM generated? YES	NO.:#





42826 #1

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Cooler Received/Opened On 12/17/2013@ 0900	
1. Tracking #(last 4 digits, FedEx)	
Courier: <u>FedEx</u> IR Gun ID <u>18290455</u>	
2. Temperature of rep. sample or temp blank when opened:	
3. If Item #2 temperature is $0^{\circ}$ C or less, was the representative sample or temp blank frozen?	YES NO. (NA
4. Were custody seals on outside of cooler?	YES. NONA
If yes, how many and where:	
5. Were the seals intact, signed, and dated correctly?	YES NONA
6. Were custody papers inside cooler?	YESNONA
I certify that I opened the cooler and answered questions 1-6 (intial)	
7. Were custody seals on containers: YES and Intact	YESNO.
Were these signed and dated correctly?	YESNO (NA)
8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Pape	r Other None
9. Cooling process: Ice lce-pack Ice (direct contact) Dry ice	Other None
10. Did all containers arrive in good condition (unbroken)?	YES NONA
11. Were all container labels complete (#, date, signed, pres., etc)?	(VES)NONA
12. Did all container labels and tags agree with custody papers?	(ES)NONA
13a. Were VOA vials received?	YES)NONA
b. Was there any observable headspace present in any VOA vial?	YESNO.(NA)
14. Was there a Trip Blank in this cooler? YES NA If multiple coolers, sequen	ce #
certify that I unloaded the cooler and answered questions 7-14 (intial)	MOVS
15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level?	YESNO.NA
b. Did the bottle labels indicate that the correct preservatives were used	ESNONA
16. Was residual chlorine present?	YESNONA
I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial)	MDn
17. Were custody papers properly filled out (ink, signed, etc)?	ESNONA
18. Did you sign the custody papers in the appropriate place?	ESNONA
19. Were correct containers used for the analysis requested?	XES)NONA
20. Was sufficient amount of sample sent in each container?	YES)NONA
certify that I entered this project into LIMS and answered questions 17-20 (intial)	mom
I certify that I attached a label with the unique LIMS number to each container (intial)	mom
21. Were there Non-Conformance issues at login? YES. NO Was a NCM generated? YES.	.NO).#

Serial Number 82047

Tes	tAn			AND CHAI	N OF CUSTODY	RE	COI	RD	Ż	51 Sa	02 LaR wannah	rica Savoche Avoche Avo	renue 404		ation			Phone:	(912)	v.testame 354-7858 2-0165	Lo	2826	12/18/2013
THE LEAD	ER IN ENVIF	RONMENTAL	TESTING								Vasi	nul	e					Fax:					
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CLIENT NAME  ARCA	<b>6</b> 175		CLIENT E-MAI	raetza	Jaradis-1/s a	in Substitution	(ט) מארוט	۵	AIR NONAQUEOUS LIQUID (OIL, SOLVENT,)	HCT.	2	7	鱼							DELIVE (SURCH	IARGE)	$\int_{1}^{\infty} dc$	ey ,
CLIENT ADDRE	SS					ao	(TER)	ISOI.	i Lla	7-		1 -	8								TE DUE		t' n/A
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RECEIVED FOR (SIGNATURE)	LABORATORY E	3Y:	DATE	TIME	CUSTODY INTACT YES O	9	SEAL I	ODY NO.		SAVAI LOG N			LABOR	RATORY	'REMAF	RKS							

#### **Login Sample Receipt Checklist**

Client: ARCADIS U.S. Inc Job Number: 490-42826-1

Login Number: 42826 List Source: TestAmerica Nashville

List Number: 1

Creator: McBride, Mike

Creator: MCBride, Mike		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.8 / 5.5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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THE LEADER IN ENVIRONMENTAL TESTING

#### ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Nashville 2960 Foster Creighton Drive Nashville, TN 37204 Tel: (615)726-0177

TestAmerica Job ID: 490-42826-2 Client Project/Site: JBC Terminal

For:

ARCADIS U.S. Inc 1100 Welborne Drive Suite 100 Richmond, Virginia 23229

Attn: Sterling Turner

Jennifer Huckala

Authorized for release by: 12/19/2013 2:02:00 PM

Jennifer Huckaba, Project Manager II (615)301-5042 jennifer.huckaba@testamericainc.com

.....LINKS .....

Review your project results through

Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-2

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Case Narrative	4
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Certification Summary	11
Chain of Custody	12
Pacaint Chacklists	15

#### **Sample Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-42826-1	106	Water	12/16/13 13:15	12/17/13 09:00

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### **Case Narrative**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-2

Job ID: 490-42826-2

Laboratory: TestAmerica Nashville

Narrative

Job Narrative 490-42826-2

Comments

No additional comments.

Receipt

The samples were received on 12/17/2013 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 3.8° C and 5.5° C.

**General Chemistry** 

No analytical or quality issues were noted.

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## **Definitions/Glossary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-2

### **Qualifiers**

### **General Chemistry**

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## **Glossary**

RER

RPD

TEF

TEQ

RL

Relative error ratio

Toxicity Equivalent Factor (Dioxin)
Toxicity Equivalent Quotient (Dioxin)

Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control

## **Client Sample Results**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-2

Client Sample ID: 106 Lab Sample ID: 490-42826-1

Date Collected: 12/16/13 13:15 Matrix: Water

Date Received: 12/17/13 09:00

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.5		1.0	0.50	mg/L			12/17/13 18:28	1

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## **QC Sample Results**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-2

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Client Sample ID: Matrix Spike Duplicate

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA RPD Limit Client Sample ID: Matrix Spike

Method: SM 5310B - Organic Carbon, Total (TOC)

Lab Sample ID: MB 490-130039/1 **Matrix: Water** 

Analysis Batch: 130039

мв мв

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac 1.0 12/17/13 18:28 **Total Organic Carbon** 1.0 U 0.50 mg/L

Lab Sample ID: LCS 490-130039/5

**Matrix: Water** 

**Analysis Batch: 130039** 

LCS LCS %Rec. Spike Analyte Added Result Qualifier Unit %Rec Limits Total Organic Carbon 10.0 10.0 mg/L 100 90 - 110

Lab Sample ID: LCSD 490-130039/6

**Matrix: Water** 

Analysis Batch: 130039

Spike LCSD LCSD %Rec. Added Result Qualifier Unit %Rec Limits **RPD** Total Organic Carbon 10.0 10.8 108 mg/L

Lab Sample ID: 490-42791-D-1 MS

**Matrix: Water** 

Analysis Batch: 130039

,										
	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Total Organic Carbon	1.3		20.0	20.5		mg/L		96	74 - 134	

Lab Sample ID: 490-42791-D-1 MSD

**Matrix: Water** 

Analysis Batch: 130039

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Total Organic Carbon	1.3		20.0	20.1		mg/L		94	74 - 134	2	20

## **QC Association Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-2

## **General Chemistry**

## Analysis Batch: 130039

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-42791-D-1 MS	Matrix Spike	Total/NA	Water	SM 5310B	
490-42791-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 5310B	
490-42826-1	106	Total/NA	Water	SM 5310B	
LCS 490-130039/5	Lab Control Sample	Total/NA	Water	SM 5310B	
LCSD 490-130039/6	Lab Control Sample Dup	Total/NA	Water	SM 5310B	
MB 490-130039/1	Method Blank	Total/NA	Water	SM 5310B	

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## **Lab Chronicle**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal

Client Sample ID: 106

TestAmerica Job ID: 490-42826-2

Lab Sample ID: 490-42826-1

Matrix: Water

Date Collected: 12/16/13 13:15 Date Received: 12/17/13 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 5310B		1		50 mL	130039	12/17/13 18:28	CLJ	TAL NSH

#### Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

## **Method Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-2

Method	Method Description	Protocol	Laboratory
SM 5310B	Organic Carbon, Total (TOC)	SM	TAL NSH

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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## **Certification Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-42826-2

## Laboratory: TestAmerica Nashville

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	<b>Expiration Date</b>
Virginia	NELAP	3	460152	06-14-14

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## **COOLER RECEIPT FORM**

Cooler Received/Opened On 12/17/2013 @ 900	
1. Tracking # <u> U029</u> (last 4 digits, FedEx)	
Courier:FedEx IR Gun ID17610176	
2. Temperature of rep. sample or temp blank when opened:	
3. If Item #2 temperature is $0^{\circ}\text{C}$ or less, was the representative sample or temp blank frozen?	YES NO NA
4. Were custody seals on outside of cooler?	YESNONA
If yes, how many and where:	
5. Were the seals intact, signed, and dated correctly?	YESNONA
6. Were custody papers inside cooler?	YES NO. NA
certify that I opened the cooler and answered questions 1-6 (intial)	· · · · · · · · · · · · · · · · · · ·
7. Were custody seals on containers: YES (NO) and Intact	YESNO. NA
Were these signed and dated correctly?	YESNONA
3. Packing mat'l used Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper	Other None
O. Cooling process: (Ite ) lce-pack   lce (direct contact)   Dry ice	Other None
10. Did all containers arrive in good condition (unbroken)?	(ES)NONA
11. Were all container labels complete (#, date, signed, pres., etc)?	(YES)NONA
12. Did all container labels and tags agree with custody papers?	(ES.)NONA
3a. Were VOA vials received?	YES. (NO) NA
b. Was there any observable headspace present in any VOA vial?	YESNO. NA
14. Was there a Trip Blank in this cooler? YESNO.	ce #
certify that I unloaded the cooler and answered questions 7-14 (intial)	mom
I5a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? $_{\ell}$	(ES)NONA
b. Did the bottle labels indicate that the correct preservatives were used	(YES)NONA
16. Was residual chlorine present?	YESNONA
certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial)	MDm
17. Were custody papers properly filled out (ink, signed, etc)?	ÆS).NONA
18. Did you sign the custody papers in the appropriate place?	YES)NONA
19. Were correct containers used for the analysis requested?	YESNONA
20. Was sufficient amount of sample sent in each container?	ESNONA
certify that I entered this project into LIMS and answered questions 17-20 (intial)	Min
certify that I attached a label with the unique LIMS number to each container (intial)	mgu
21. Were there Non-Conformance issues at login? YES…NØ Was a NCM generated? YES	NO):#





Loc: 490 42826

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Cooler Received/Opened On 12/17/2013@ 0900	
i. Tracking #(last 4 digits, FedEx)	
Courier: FedEx IR Gun ID 18290455	
2. Temperature of rep. sample or temp blank when opened: 3rODegrees Celsius	
3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen?	YES NO. (.NA
1. Were custody seals on outside of cooler?	(YES).NONA
If yes, how many and where:	
5. Were the seals intact, signed, and dated correctly?	YES NONA
3. Were custody papers inside cooler?	YESNONA
certify that I opened the cooler and answered questions 1-6 (intial)	
7. Were custody seals on containers: YES 🍏 and Intact	YESNO.
Were these signed and dated correctly?	YESNO NA
3. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper	Other None
D. Cooling process: Ice lce-pack lce (direct contact) Dry ice	Other None
10. Did all containers arrive in good condition (unbroken)?	YES NONA
11. Were all container labels complete (#, date, signed, pres., etc)?	(ES)NONA
12. Did all container labels and tags agree with custody papers?	ÆS)NONA
13a. Were VOA vials received?	YES)NONA
b. Was there any observable headspace present in any VOA vial?	YESNO. NA
14. Was there a Trip Blank in this cooler? YES (Ng)NA If multiple coolers, sequenc	e #
certify that I unloaded the cooler and answered questions 7-14 (intial)	wow.
15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level?	YESNO.NA
b. Did the bottle labels indicate that the correct preservatives were used	(ES).NONA
16. Was residual chlorine present?	YESNONA
certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial)	MDm
7. Were custody papers properly filled out (ink, signed, etc)?	(ESNONA
8. Did you sign the custody papers in the appropriate place?	ÆSNONA
9. Were correct containers used for the analysis requested?	XES NO NA
20. Was sufficient amount of sample sent in each container?	YES)NONA
certify that I entered this project into LIMS and answered questions 17-20 (intial)	MDM
certify that I attached a label with the unique LIMS number to each container (intial)	Mom
1. Were there Non-Conformance issues at login? YES. NO Was a NCM generated? YES.	vo).#

Serial Number 82047

Testamerica  The Leader in environmental testing							ID	TestAmerica Savannah 5102 LaRoche Avenue Savannah, GA 31404  Alternate Laboratory Name/Location TestAmerica Noshville			Website: www.testameri			i lo	c: 490 <b>2826</b>	12/19/2013							
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RECEIVED FOR (SIGNATURE)	LABORATORY B	iY:	DATE	TIME	CUSTODY INTACT YES NO	C	USTO EAL N	IO.	-	SAVAN LOG N			LABOR	RATORY	REMAR	KS							

## **Login Sample Receipt Checklist**

Client: ARCADIS U.S. Inc Job Number: 490-42826-2

Login Number: 42826 List Source: TestAmerica Nashville

List Number: 1

Creator: McBride, Mike

Creator: McBride, Mike		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.8 / 5.5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Nashville 2960 Foster Creighton Drive Nashville, TN 37204 Tel: (615)726-0177

TestAmerica Job ID: 490-43438-1 Client Project/Site: JBC Terminal

#### For:

ARCADIS U.S. Inc 1100 Welborne Drive Suite 100 Richmond, Virginia 23229

Attn: Sterling Turner

Gennifer Huckala

Authorized for release by: 12/26/2013 4:58:42 PM

Jennifer Huckaba, Project Manager II (615)301-5042

jennifer.huckaba@testamericainc.com

·····LINKS ······

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**Have a Question?** 



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-1

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## **Sample Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal

Lab Sample ID 490-43438-1

TestAmerica Job ID: 490-43438-1

Client Sample ID	Matrix	Collected	Received
106	Water	12/23/13 12:00	12/24/13 09:10

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#### **Case Narrative**

Client: ARCADIS U.S. Inc

TestAmerica Job ID: 490-43438-1

Project/Site: JBC Terminal

Job ID: 490-43438-1

**Laboratory: TestAmerica Nashville** 

Narrative

Job Narrative 490-43438-1

#### Comments

No additional comments.

#### Receipt

The sample was received on 12/24/2013 9:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.8° C.

#### GC/MS VOA

Method(s) 8260B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for batch 131263 were outside control limits. Sample matrix interference and/or non-homogeniety are suspected because the associated laboratory control sample / laboratory sample control duplicate (LCS/LCSD) precision was within acceptance limits.

No other analytical or quality issues were noted.

#### GC Semi VOA

Method(s) 8015C: The method blank for preparation batch 131627 contained c10-c28 above the reporting limit (RL). The sample was analyzed two times, both with blank detections. There was insufficient sample to perform a re-extraction and/or re-analysis for a third time; therefore, the data of the re-analysis has been reported.

Method(s) 8015C: Insufficient sample volume was available to perform batch matrix spike/matrix spike duplicate (MS/MSD) associated with batch 131627.

No other analytical or quality issues were noted.

### **General Chemistry**

No analytical or quality issues were noted.

#### **Organic Prep**

No analytical or quality issues were noted.

#### **VOA Prep**

No analytical or quality issues were noted.

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## **Definitions/Glossary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-1

#### **Qualifiers**

### **GC/MS VOA**

Qualifier	Qualifier Description
F	MS/MSD Recovery and/or RPD exceeds the control limits
U	Indicates the analyte was analyzed for but not detected.

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

#### **GC Semi VOA**

 Qualifier
 Qualifier Description

 B
 Compound was found in the blank and sample.

#### **General Chemistry**

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### **Glossary**

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration

DLC Decision level concentration

MDA Minimum detectable activity

EDL Estimated Detection Limit

MDC Minimum detectable concentration

MDL Method Detection Limit
ML Minimum Level (Dioxin)
NC Not Calculated

ND Not detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control
RER Relative error ratio

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TestAmerica Nashville

## **Client Sample Results**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal

Client Sample ID: 106

TestAmerica Job ID: 490-43438-1

Lab Sample ID: 490-43438-1

Matrix: Water

Date Collected: 12/23/13 12:00 Date Received: 12/24/13 09:10

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0	0.20	ug/L			12/24/13 19:47	1
Toluene	0.18	J	1.0	0.17	ug/L			12/24/13 19:47	1
Ethylbenzene	1.0	U	1.0	0.19	ug/L			12/24/13 19:47	1
Xylenes, Total	3.0	U	3.0	0.58	ug/L			12/24/13 19:47	1
Naphthalene	5.0	U	5.0	0.21	ug/L			12/24/13 19:47	•
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		70 - 130					12/24/13 19:47	1
4-Bromofluorobenzene (Surr)	92		70 - 130					12/24/13 19:47	1
Dibromofluoromethane (Surr)	102		70 - 130					12/24/13 19:47	1
Toluene-d8 (Surr)	93		70 - 130					12/24/13 19:47	1
- -		ng GC/FID		el Range	Organics	s)		12/24/13 19:47	1
Toluene-d8 (Surr)  Method: 8015C - Nonhalogena Analyte	ated Organics usi	ng GC/FID		el Range <sub>MDL</sub>	_	s) D	Prepared	12/24/13 19:47 Analyzed	Dil Fac
_ Method: 8015C - Nonhalogena	ated Organics usi	Qualifier	-Modified (Dies	_	_	•	Prepared 12/26/13 11:34		·
Method: 8015C - Nonhalogena Analyte	ated Organics usi Result	Qualifier B	-Modified (Dies	MDL	Unit	•		Analyzed	·
Method: 8015C - Nonhalogena Analyte C10-C28	ated Organics usi Result 0.22	Qualifier B	-Modified (Diese RL 0.10	MDL	Unit	•	12/26/13 11:34	<b>Analyzed</b> 12/26/13 14:54	Dil Fac
Method: 8015C - Nonhalogena Analyte C10-C28	ated Organics usi Result 0.22 %Recovery	Qualifier B	-Modified (Diese P.L. 0.10	MDL	Unit	•	12/26/13 11:34  Prepared	Analyzed 12/26/13 14:54  Analyzed	Dil Fac
Method: 8015C - Nonhalogena Analyte C10-C28 Surrogate o-Terphenyl (Surr)	ated Organics usi Result 0.22  %Recovery 85	Qualifier B	-Modified (Diese P.L. 0.10	MDL	Unit mg/L	•	12/26/13 11:34  Prepared	Analyzed 12/26/13 14:54  Analyzed	Dil Fac

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 490-131263/7

**Matrix: Water** 

Analysis Batch: 131263

Client Sample ID: Method Blank

Prep Type: Total/NA

ı		IVID	MID							
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Benzene	1.0	U	1.0	0.20	ug/L			12/24/13 14:24	1
ı	Toluene	1.0	U	1.0	0.17	ug/L			12/24/13 14:24	1
	Ethylbenzene	1.0	U	1.0	0.19	ug/L			12/24/13 14:24	1
١	Xylenes, Total	3.0	U	3.0	0.58	ug/L			12/24/13 14:24	1
	Naphthalene	5.0	U	5.0	0.21	ug/L			12/24/13 14:24	1
ı										

MD MD

	IND	IVID				
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		70 - 130		12/24/13 14:24	1
4-Bromofluorobenzene (Surr)	91		70 - 130		12/24/13 14:24	1
Dibromofluoromethane (Surr)	102		70 - 130		12/24/13 14:24	1
Toluene-d8 (Surr)	96		70 - 130		12/24/13 14:24	1

Lab Sample ID: LCS 490-131263/3

**Matrix: Water** 

Analysis Batch: 131263

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Benzene	50.0	48.3		ug/L		97	80 - 121	
Toluene	50.0	44.0		ug/L		88	80 - 126	
Ethylbenzene	50.0	50.8		ug/L		102	80 - 130	
Xylenes, Total	100	99.5		ug/L		100	80 - 132	
Naphthalene	50.0	37.4		ug/L		75	62 - 138	

LCS LCS

Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	101		70 - 130
4-Bromofluorobenzene (Surr)	95		70 - 130
Dibromofluoromethane (Surr)	100		70 - 130
Toluene-d8 (Surr)	89		70 - 130

Lab Sample ID: LCSD 490-131263/4

**Matrix: Water** 

Analysis Batch: 131263

Client Sample ID: La	ab Control Sample Dup
	Prep Type: Total/NA

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	50.0	48.5		ug/L		97	80 - 121	0	17
Toluene	50.0	44.2		ug/L		88	80 - 126	0	15
Ethylbenzene	50.0	49.7		ug/L		99	80 - 130	2	15
Xylenes, Total	100	99.8		ug/L		100	80 - 132	0	15
Naphthalene	50.0	38.3		ug/L		77	62 - 138	3	26

LCSD LCSD

Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	103		70 - 130
4-Bromofluorobenzene (Surr)	96		70 - 130
Dibromofluoromethane (Surr)	103		70 - 130
Toluene-d8 (Surr)	91		70 - 130

TestAmerica Nashville

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12/26/2013

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-1

### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 490-42944-C-1 MS

**Matrix: Water** 

Analysis Batch: 131263

Client Sample ID: Matrix Spike Prep Type: Total/NA

Spike MS MS %Rec. Sample Sample Result Qualifier Analyte babbA Result Qualifier %Rec Limits Unit Benzene 1.0 U 50.0 48.8 ug/L 98 75 - 133 ug/L Toluene 1.0 U 50.0 46.6 93 75 - 136 50.0 Ethylbenzene 0.25 51.0 ug/L 102 79 - 139 100 100 Xylenes, Total 0.74 J 101 ug/L 74 - 141 Naphthalene 7.6 50.0 37.8 ug/L 60 55 - 140

MS MS

Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	98		70 - 130
4-Bromofluorobenzene (Surr)	92		70 - 130
Dibromofluoromethane (Surr)	99		70 - 130
Toluene-d8 (Surr)	93		70 - 130

Lab Sample ID: 490-42944-C-1 MSD

**Matrix: Water** 

Analysis Batch: 131263

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	1.0	U	50.0	34.0	F	ug/L		68	75 - 133	36	17
Toluene	1.0	U	50.0	32.9	F	ug/L		66	75 - 136	35	15
Ethylbenzene	0.25	J	50.0	35.1	F	ug/L		70	79 - 139	37	15
Xylenes, Total	0.74	J	100	70.0	F	ug/L		69	74 - 141	36	15
Naphthalene	7.6		50.0	39.6		ug/L		64	55 - 140	5	26

MSD MSD

Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		70 - 130
4-Bromofluorobenzene (Surr)	93		70 - 130
Dibromofluoromethane (Surr)	99		70 - 130
Toluene-d8 (Surr)	95		70 - 130

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

MB MB Result Qualifier

Lab Sample ID: MB 490-131627/1-A

**Matrix: Water** 

Analyte

Analysis Batch: 131609

Client Sample ID: Method Blank Prep Type: Total/NA

Client Sample ID: Lab Control Sample

Prepared

**Prep Batch: 131627** 

C10-C28 0.107 0.10 0.040 mg/L 12/26/13 11:34 12/26/13 14:23 MB MB

RL

MDL Unit

Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac 50 - 150 12/26/13 11:34 12/26/13 14:23 o-Terphenyl (Surr) 82

Lab Sample ID: LCS 490-131627/2-A

**Matrix: Water** 

Analysis Batch: 131609

Spike LCS LCS %Rec. Analyte Added Result Qualifier Limits Unit %Rec C10-C28 0.800 0.838 mg/L 105 46 - 132

TestAmerica Nashville

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Analyzed Dil Fac

12/26/2013

Limits

50 - 150

TestAmerica Job ID: 490-43438-1

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal

Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics) (Continued)

Lab Sample ID: LCS 490-131627/2-A

**Matrix: Water** 

Analysis Batch: 131609

**Client Sample ID: Lab Control Sample** 

**Prep Batch: 131627** 

LCS LCS

Surrogate %Recovery Qualifier o-Terphenyl (Surr) 90

Prep Type: Total/NA

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 490-131242/1

**Matrix: Water** 

Analysis Batch: 131242

Client Sample ID: Method Blank

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Client Sample ID: Duplicate

**Client Sample ID: Duplicate** 

MB MB

Analyte Result Qualifier RL MDL Unit D Prepared Dil Fac Analyzed Total Suspended Solids 1.0 1.0 U 0.70 mg/L 12/24/13 12:30

Lab Sample ID: LCS 490-131242/2

**Matrix: Water** 

Analysis Batch: 131242

		Spike	LCS	LCS				%Rec.	
Analyte		Added	Result	Qualifier	Unit	D	%Rec	Limits	
Total Suspended Solids		101	102		ma/L		101	90 - 110	

Lab Sample ID: 490-43310-C-1 DU

**Matrix: Water** 

Analysis Batch: 131242

	Sample	Sample	DU	DU					RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D		RPD	Limit
Total Suspended Solids	280		269		mg/L		 	3	20

Lab Sample ID: 490-43396-G-1 DU

**Matrix: Water** 

Analysis Batch: 131242									
	Sample	Sample	DU	DU					RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D		RPD	Limit
Total Suspended Solids	160		 139		mg/L		 	12	20

TestAmerica Nashville

12/26/2013

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## **QC Association Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-1

### **GC/MS VOA**

## Analysis Batch: 131263

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-42944-C-1 MS	Matrix Spike	Total/NA	Water	8260B	
490-42944-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
490-43438-1	106	Total/NA	Water	8260B	
LCS 490-131263/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 490-131263/4	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 490-131263/7	Method Blank	Total/NA	Water	8260B	

### **GC Semi VOA**

### Analysis Batch: 131609

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43438-1	106	Total/NA	Water	8015C	131627
LCS 490-131627/2-A	Lab Control Sample	Total/NA	Water	8015C	131627
MB 490-131627/1-A	Method Blank	Total/NA	Water	8015C	131627

## **Prep Batch: 131627**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43438-1	106	Total/NA	Water	3510C	
LCS 490-131627/2-A	Lab Control Sample	Total/NA	Water	3510C	
MB 490-131627/1-A	Method Blank	Total/NA	Water	3510C	

## **General Chemistry**

### Analysis Batch: 131242

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43310-C-1 DU	Duplicate	Total/NA	Water	SM 2540D	
490-43396-G-1 DU	Duplicate	Total/NA	Water	SM 2540D	
490-43438-1	106	Total/NA	Water	SM 2540D	
LCS 490-131242/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 490-131242/1	Method Blank	Total/NA	Water	SM 2540D	

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## **Lab Chronicle**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal

Client Sample ID: 106

TestAmerica Job ID: 490-43438-1

Lab Sample ID: 490-43438-1

Matrix: Water

Date Collected: 12/23/13 12:00 Date Received: 12/24/13 09:10

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	131263	12/24/13 19:47	EML	TAL NSH
Total/NA	Prep	3510C			250 mL	1 mL	131627	12/26/13 11:34	FXM	TAL NSH
Total/NA	Analysis	8015C		1	250 mL	1 mL	131609	12/26/13 14:54	JML	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	131242	12/24/13 12:30	CRM	TAL NSH

#### Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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## **Method Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL NSH
8015C	Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)	SW846	TAL NSH
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL NSH

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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## **Certification Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-1

### Laboratory: TestAmerica Nashville

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	<b>Expiration Date</b>
Virginia	NELAP	3	460152	06-14-14

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## **COOLER RECEIPT FORM**



	490-43438 Chain of Custody
Cooler Received/Opened On 12/24/2013 @ 0910	490-43436 Chain of Custody
1. Tracking #(last 4 digits, FedEx)	
Courier: FedEx IR Gun ID 17960358	
2. Temperature of rep. sample or temp blank when opened: Degr	rees Celsius
3. If Item #2 temperature is $0^{\circ}\text{C}$ or less, was the representative sample or to	emp blank frozen? YES NO. (.NA)
4. Were custody seals on outside of cooler?	MESNONA
If yes, how many and where:	<b>)</b>
5. Were the seals intact, signed, and dated correctly?	YES NONA 1 C
6. Were custody papers inside cooler?	YESNONA 'U
I certify that I opened the cooler and answered questions 1-6 (intial)	ECH
7. Were custody seals on containers:	and Intact YESNONA
Were these signed and dated correctly?	YESNONA
8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite	Foam Insert Paper Other None
9. Cooling process:	contact) Dry ice Other None
10. Did all containers arrive in good condition (unbroken)?	YESNONA
11. Were all container labels complete (#, date, signed, pres., etc)?	YÊSNONA
12. Did all container labels and tags agree with custody papers?	YESNONA
13a. Were VOA vials received?	(ŶĒ\$NONA
b. Was there any observable headspace present in any VOA vial?	YES(1)NA
14. Was there a Trip Blank in this cooler? YESNO(N) If multiple	le coolers, sequence #
I certify that I unloaded the cooler and answered questions 7-14 (intial)	
15a. On pres'd bottles, did pH test strips suggest preservation reached the	e correct pH level? YEŞNONA
b. Did the bottle labels indicate that the correct preservatives were used	t (E)NONA
16. Was residual chlorine present?	YESNOMA
I certify that I checked for chlorine and pH as per SOP and answered questi	ions 15-16 (intial)
17. Were custody papers properly filled out (ink, signed, etc)?	(É9NONA
18. Did you sign the custody papers in the appropriate place?	ESNONA
19. Were correct containers used for the analysis requested?	ESNONA
20. Was sufficient amount of sample sent in each container?	χΈ9NONA
I certify that I entered this project into LIMS and answered questions 17-20	
I certify that I attached a label with the unique LIMS number to each contain	ner (intial)
21. Were there Non-Conformance issues at login? YESNO Was a NCM (	generated? YES#

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Serial Number

80743

12/26/2013

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<u>TestAmerica</u>	or 00010D1	RECO	טחי		51 Sa	02 LaRe vannah	loche A n, GA 3	31404					Website: Phone: (912)	912) 354	stamericai -7858 165	nc.com	
THE LEADER IN ENVIRONMENTAL TESTING PROJECT REFERENCE	PROJECT LOCATION				X Alt	 	Labora 1Vi	atory Na IIC	ame/Loc	eation			Phone: Fax:				
TAL (LAB) PROJECT MANAGER TENNIFER  CLIENT (SITE) PM  CLIENT (SITE) PM  CLIENT (SITE) PM  CLIENT HONE  703. 4(05. 4213  CLIENT E-MAIL  CLIENT ADDRESS  SIOI WISON BLVD Arington  COMPANY CONTRACTING THIS WORK (if applicable)	(STATE) VA CONTRACT NO.  CLIENT FAX	ÄB (G) INDICATE	SOLID OR SEMISOLID ALT	(OIL, SOLVENT,)	NOVETPH DRO	NONE TSS	Hassa TOC	STEX+ NAPTH	EQUIRE!		Loc:	490 <b>438</b>		EX DE (SU	GE  TANDARD R ELIVERY  DATE DUI ELIVERY JRCHARGE DATE DUE MBER OF C R SHIPMEN	EE E 1 do	
DATE TIME SAMPLE IDENTIFICATION 2/23/13 1200 100		COMP	SOLID	NONAC	1			MBER OF	F CONTA	INERS S	SUBMIT	ΓED		Ne	red TS	EMARKS SSRL	. I mg
CEIVED RV: (SIGNATURE)	ELINQUISHED BY: (SIGNATURE)	i	5 A	M 2.8	1	ATE,	/3	TIME ひ <sup>९</sup> \	O	ECEIVE					DATE	TIN	
YES	JSTODY INTACT	LABORATO CUSTOD' SEAL NO.	Υ	SA	NLY AVANNAI OG NO.			ABORAT	TORY RE	MARKS							

TestAmerica Savannah

## **Login Sample Receipt Checklist**

Client: ARCADIS U.S. Inc Job Number: 490-43438-1

Login Number: 43438 List Source: TestAmerica Nashville

List Number: 1

Creator: Buckingham, Paul

oreator. Buckingham, Faul		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

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THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Nashville 2960 Foster Creighton Drive Nashville, TN 37204 Tel: (615)726-0177

TestAmerica Job ID: 490-43438-2 Client Project/Site: JBC Terminal

For:

ARCADIS U.S. Inc 1100 Welborne Drive Suite 100 Richmond, Virginia 23229

Attn: Sterling Turner

Jennifer Huckaba

Authorized for release by: 12/27/2013 5:55:08 PM

Jennifer Huckaba, Project Manager II (615)301-5042

jennifer.huckaba@testamericainc.com

·····LINKS ······

Review your project results through

Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-2

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## **Sample Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-43438-1	106	Water	12/23/13 12:00	12/24/13 09:10

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#### **Case Narrative**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-2

Job ID: 490-43438-2

Laboratory: TestAmerica Nashville

Narrative

Job Narrative 490-43438-2

#### Comments

TOC only (due to turnaround time).

The sample was received on 12/24/2013 9:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.8° C.

#### **General Chemistry**

No analytical or quality issues were noted.

## **Definitions/Glossary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-2

### **Qualifiers**

### **General Chemistry**

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## **Glossary**

RL

RPD

TEF

TEQ

Reporting Limit or Requested Limit (Radiochemistry)

Toxicity Equivalent Factor (Dioxin)
Toxicity Equivalent Quotient (Dioxin)

Relative Percent Difference, a measure of the relative difference between two points

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio

## **Client Sample Results**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal

Client Sample ID: 106

TestAmerica Job ID: 490-43438-2

Lab Sample ID: 490-43438-1

Date Collected: 12/23/13 12:00 Date Received: 12/24/13 09:10 Matrix: Water

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.4		1.0	0.50	mg/L			12/26/13 17:23	1

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## QC Sample Results

Client: ARCADIS U.S. Inc TestAmerica Job ID: 490-43438-2 Project/Site: JBC Terminal

RPD

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Client Sample ID: Method Blank Prep Type: Total/NA

мв мв

Result Qualifier 1.0 U

RL 1.0

MDL Unit 0.50 mg/L D

Prepared

Analyzed 12/26/13 17:23

**Client Sample ID: Lab Control Sample** 

%Rec.

%Rec.

Limits

74 - 134

Dil Fac

Lab Sample ID: LCS 490-131986/5

Lab Sample ID: 490-43058-A-1 MS

Lab Sample ID: MB 490-131986/1

**Matrix: Water** 

**Total Organic Carbon** 

**Matrix: Water** 

Analyte

Analysis Batch: 131986

Analysis Batch: 131986

Analyte

Total Organic Carbon

Method: SM 5310B - Organic Carbon, Total (TOC)

Spike Added 10.0

LCS LCS 10.3

Result Qualifier

Unit mg/L

%Rec Limits 103 90 - 110

Client Sample ID: Matrix Spike Prep Type: Total/NA

Prep Type: Total/NA

Analysis Batch: 131986

**Matrix: Water** 

**Matrix: Water** 

Total Organic Carbon

Total Organic Carbon

Lab Sample ID: 490-43058-A-1 MSD

Spike Sample Sample Result Qualifier 0.81

Added 20.0

MS MS Result 20.6

Qualifier Unit mg/L

%Rec

Client Sample ID: Matrix Spike Duplicate Prep Type: Total/NA

Analysis Batch: 131986

Analyte

0.81 J

Sample Sample

Result Qualifier Added 20.0

Spike

MSD MSD Result Qualifier 20.5

Unit mg/L

%Rec 98

74 - 134

%Rec. Limits Limit

TestAmerica Nashville

## **QC Association Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-2

## **General Chemistry**

## Analysis Batch: 131986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43058-A-1 MS	Matrix Spike	Total/NA	Water	SM 5310B	
490-43058-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 5310B	
490-43438-1	106	Total/NA	Water	SM 5310B	
LCS 490-131986/5	Lab Control Sample	Total/NA	Water	SM 5310B	
MB 490-131986/1	Method Blank	Total/NA	Water	SM 5310B	

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#### **Lab Chronicle**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal

Client Sample ID: 106

TestAmerica Job ID: 490-43438-2

Lab Sample ID: 490-43438-1

**Matrix: Water** 

Date Collected: 12/23/13 12:00 Date Received: 12/24/13 09:10

Batch Batch Dil Initial Final Batch Prepared Prep Type Method or Analyzed Type Run Factor Amount Amount Number Analyst Lab Total/NA Analysis SM 5310B 50 mL 131986 12/26/13 17:23 JKF TAL NSH

#### Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

## **Method Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-2

TAL NSH

Durán a al	I also and a more
Protocol	Laboratory

SM

**Protocol References:** 

Method

SM 5310B

SM = "Standard Methods For The Examination Of Water And Wastewater",

**Method Description** 

Organic Carbon, Total (TOC)

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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# **Certification Summary**

Client: ARCADIS U.S. Inc Project/Site: JBC Terminal TestAmerica Job ID: 490-43438-2

#### **Laboratory: TestAmerica Nashville**

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	<b>Expiration Date</b>
Virginia	NELAP	3	460152	06-14-14

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### COOLER RECEIPT FORM



Cooler Received/Opened On	12/24/2013 @ 0910		490-43438 Chain of Cu	stody
1. Tracking #	(last 4 digits, FedEx)			
Courier: <u>FedEx</u> IR Gun ID	<u>17960358</u>	- /		
2. Temperature of rep. sample or te	mp blank when opened:	Degrees Celsius		
3. If Item #2 temperature is 0°C or le	ss, was the representative	sample or temp blank froze	en? YES NO. NA	
4. Were custody seals on outside of	cooler?	10	WES NONA	
If yes, how many and where:	•	1 front		
5. Were the seals intact, signed, and	dated correctly?	C	YESNONA	4900
6. Were custody papers inside coole	r?	r (1)	YESNONA	4000
I certify that I opened the cooler and	answered questions 1-6 (in	ntial) ECM		
7. Were custody seals on containers	S: YES	NO and Intact	YESNONA	
Were these signed and dated corr	ectly?		YESNONA	
8. Packing mat'l used? Bubblewrap	Plastic bag Peanuts Ve	ermiculite Foam Insert Pa	per Other None	
9. Cooling process:	(ice) lce-pack	Ice (direct contact) Dry	ice Other None	
10. Did all containers arrive in good	condition (unbroken)?	,	YESNONA	
11. Were all container labels comple	te (#, date, signed, pres., e	tc)?	YESNONA	
12. Did all container labels and tags	agree with custody papers	5?	YESNONA	
13a. Were VOA vials received?			YESNONA	
b. Was there any observable head	space present in any VOA	vial?	YES(1)NA	
14. Was there a Trip Blank in this co-	oler? YESNO(NA	If multiple coolers, sequ	ence #	
I certify that I unloaded the cooler and	d answered questions 7-14	1 (intial)	()	
15a. On pres'd bottles, did pH test st	rips suggest preservation	reached the correct pH leve	el? YÊŞNONA	
b. Did the bottle labels indicate th	at the correct preservative	es were used	E9NONA	
16. Was residual chlorine present?			YESNONA	
I certify that I checked for chlorine an	id pH as per SOP and ansv	vered questions 15-16 (intia	<u>n</u> 7	
17. Were custody papers properly fill	led out (ink, signed, etc)?		(É)NONA	
18. Did you sign the custody papers	in the appropriate place?		(ESNONA	-
19. Were correct containers used for	the analysis requested?		Esnona	
20. Was sufficient amount of sample	sent in each container?		YESNONA	
I certify that I entered this project into	LIMS and answered ques	tions 17-20 (intial)	<u> </u>	
I certify that I attached a label with the	e unique LIMS number to ε	each container (intial)	ye	
21 Were there Non-Conformance ice	use at login 2 VES MO	Mas a NCM generated? VES	# GT #	

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Serial Number

80743

12/27/2013

Page 13 of 14

ANALYSIS REQUEST AND CHA	AIN OF OUGTON								Se	erial N	umbei	r 8	U/2	73		
TestAmerica	AIN OF CUSTODY	REC	ORD		51	stAmer 02 LaRo vannah,	oche,	avannah Avenue 31404				Website Phone: Fax: (91	(912) 35	estamericair 54-7858 0165	ic.com	
THE LEADER IN ENVIRONMENTAL TESTING				\$	Alt	VOSV	abora	atory Name/	Location	1		Phone:				
PROJECT REFERENCE  JBC TETMING  PROJECT NO.	PROJECT LOCATION (STATE)		MATR TYPE					REQUI	RED ANA	LYSIS		гах.		PAGE		OF i
TAL (LAB) PROJECT MANAGER P.O. NUMBER	CONTRACT NO.										: 490			STANDARD RE	)	
CLIENT NAME  P.O. NUMBER  P.O. NUMBER  P.O. NUMBER  P.O. NUMBER  P.O. NUMBER  CLIENT PHONE  703-465-4213  CLIENT E-MAIL	CLIENT FAX	INDICATI		OLVENT,	Dro			Napth		43	3438	3		DELIVERY DATE DUE		$\supset$
CLIENT NAME  PLCADIS  CLIENT E-MAIL  METERITH. TOE  CLIENT E-MAIL  METERITH. TOE  CLIENT E-MAIL  METERITH. TOE  COMPANY CONTRACTING THIS WORK (if applicable)  SAMPLE  DATE  TIME  SAMPLE IDENTIFICATION  CLIENT E-MAIL  METERITH. TOE  SAMPLE IDENTIFICATION  CLIENT E-MAIL  METERITH. TOE  SAMPLE IDENTIFICATION  CLIENT E-MAIL  CLIENT E-MAIL  METERITH. TOE  SAMPLE IDENTIFICATION  CLIENT E-MAIL  CLIENT E-MAIL  METERITH. TOE  SAMPLE IDENTIFICATION  CLIENT E-MAIL  CLIENT E-MAIL  CLIENT E-MAIL  METERITH. TOE  SAMPLE IDENTIFICATION  CLIENT E-MAIL  METERITH. TOE  SAMPLE IDENTIFICATION  CLIENT E-MAIL  CLIE	tzabarcadis-	SRAB (G)		NONAQUEOUS LIQUID (OIL, SOLVENT,)		1.55	707	+					[	EXPEDITED RE		<b></b>
SIOI WILSON BLVD Arlington COMPANY CONTRACTING THIS WORK (If applicable)	VA 22201	(C) OR (	MISOLIE	SLIQUI	NOVETPH	1		STEX						SURCHARGE) DATE DUE	Lda	LTAT
SAMPLE SAMPLE		POSITE FOUS (M	O OR SE	AQUEOU	NON	NONE	Frigor	2	RV	AT			N P	IUMBER OF CO ER SHIPMENT	OOLERS SU	
DATE TIME SAMPLE IDENTIFICATION 12/23/13 12.00 106	ON	COM	SOLIE	NON				MBER OF CO	VTAINERS	S SUBMIT	ITED			RE	MARKS	
4-5/15/1200 ΙΟΦ		G	-	++	1	1	1	1					N	eed TS	SRL	1 mg//
				++-												
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ELINQUISHED BY: (SIGNATURE) / DATE TIME			-				+									
MOCOUNTAL COOK 12/23/13/14/15	RELINQUISHED BY: (SIGN		15/	5.8	- 1	ATE		TIME	RELING	QUISHED	BY: (SIGI	NATURE)		DATE	TIME	
CEIVED BY: (SIGNATURE)	RECEIVED BY: (SIGNATURE		3.8	<u>~~</u>		47+/		UG 10	RECEN	/ED DV	SIGNATURI				THVIL	
	/	LABORAT	TODY.	LIOE C					TILUEN	VED BY: (	SIGNATURI	E)		DATE	TIME	
. 1	CUSTODY INTACT	CUSTOI SEAL NO	DΥ	SA	VANNA G NO.	Н	I	_ABORATORY	REMARK	(S						
																- 1

## **Login Sample Receipt Checklist**

Client: ARCADIS U.S. Inc Job Number: 490-43438-2

Login Number: 43438 List Source: TestAmerica Nashville

List Number: 1

Creator: Buckingham, Paul

orcator. Buokingham, r dar		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

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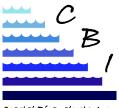
12

Client: Arcadis, US, Inc. Project ID: ARCA1301

Client Sample ID: Joint Basin Corp outfall 001

Permit No: VA0001872

Sample Period: 12/11/13 to 12/16/13



Coastal Bioanalysts, Inc.

#### **Report of Analysis: Whole Effluent Toxicity (WET)**

Submitted To:	Prepared By:
Ms. Meredith Raetz	Coastal Bioanalysts, Inc.
Arcadis US Inc.	6400 Enterprise Court
3101 Wilson Boulevard, Suite 550	Gloucester, VA 23061
Arlington, VA 22201	(804) 694-8285
	www.coastalbio.com
	Contact: Peter F. De Lisle, Technical Director

<b>Chronic Test F</b>	Results <sup>*</sup>									
Species-								48-h	LC50	
Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	T.U. <sub>C</sub>	IC25	LC50	95% C.L.	T.U. <sub>A</sub>
C. dubia	Survival	100	>100	>100	N/A	1.00	N/A	>100	N/A	<1.00
EPA 1002.0	Reproduction	25	50	35.4	17	4.00	47.8	N/A	N/A	N/A
P. promelas	Survival	100	>100	>100	N/A	1.00	N/A	>100	N/A	<1.00
EPA 1000.0	Biomass	12.5	25	17.7	23	8.00	>100	N/A	N/A	N/A

\*Note: Interrupted concentration-response curve for fathead minnow biomass due to replicate-specific mortality; net weight NOEC = 100%. Dead fish observed with external growth. Brown algae observed entrapping Ceriodaphnia in higher test concentrations. Possible interference in both tests may be caused by indigenous microorganisms present in samples. Details regarding test conduct, observations and data analysis provided in attached bench sheets and printouts.

Chronic Test QA/QC	Refere	ence Tox	icant: KC	l Units:	mg/l T	est Organ	ism Sourc	e: CBI Stock	Cultures
Species-Method	Data	% St	ırvival	Rep	roduction	(# Young	g) or Biom	ass (mg)	RTT in
(Ref. Test Date)	Source	Cont.	NOEC	Cont.	NOEC	PMSD	IC25	IC25 A.L.	Control?
C. dubia 1002.0	RTT	90	500	31.8	250	31	304	N/A	Yes
(12/1/13-12/7/13)	CC	98	500	26.7	250	22	337	260-415	
P. promelas 1000.0	RTT	98	500	0.68	500	14	635	N/A	Yes
(12/1/13-12/8/13)	CC	98	500	0.67	500	14	615	570-659	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.

The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

APPROVED:

Peter F. De Lisle, Ph.D.

Technical Director

12/23 /13 Date

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE** 

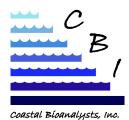


Client: Arcadis, US, Inc. Project ID: ARCA1301

Client Sample ID: Joint Basin Corp outfall 001

Permit No: VA0001872

Sample Period: 12/11/13 to 12/16/13



#### GLOSSARY OF TERMS AND ABBREVIATIONS

**A.L.** (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value  $\pm 2$  standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean  $\pm$  2 standard deviations).

**IC25:** The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

**LOEC:** Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

**PMSD:** Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

**NOAEC:** No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

**NOEC:** No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

**T.U.:** Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. T.U. $_{Ac} = 100/LC50$ . T.U. $_{Chr} = 100/NOEC$ . A dimensionless unit.



# Ceriodaphnia test set up bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

Test	t chamber:	~30 ml	glass vial:	<b>✓</b>	Illumination & photoperiod:	50-100 ft	-c 16L:8D	
			Other:		Number of replicates/treatment:	10		
	Test solution	on volume:	15 ml:	<b>~</b>	Initial number animals/replicate:	1		
			Other (ml):		Template #:	13		
CHANGES NOTES (IN DATE, SPE CHANGE N	IITIALS, ECIFIC							

SPECIES:			Cerio	daphnia dubia
ACCLIMATIO	N WATER:	Mod	d. Hard Synthe	tic Freshwater
FEEDING (Cu	Iture &Test):	YCT + Se	lenastrum capr	ricornutum mix
SOURCE:			CBI	Stock cultures
ACCLIMATIO	N TEMP (o C )	):		25
BROOD RELE	EASE FROM:		1	2/11/13 13:45
BROOD RELE	EASE TO:		1	2/11/13 20:20
DATE/TIME W	ATER ADDED	):	1	2/12/13 11:33
DATE/TIME A	NIMALS ADDI	ED:	1	2/12/13 11:45
ANIMAL AGE	WINDOW (TA	C 8 h):		6h 35m
MAX AGE AT	TEST START	(TAC 24 h):		22h 0m
TEST SET UP	BY:			BJA
TEST ID:			ARCA1301C	CD
PEER REVIE	W BY (Initial/D	ate):	РВ	12/19/13 14:2
ARCA13	301CCD			

# Ceriodaphnia daily water quality bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

		Day 0	Da	y 1	Da	y 2	Da	у 3	Da	y 4	Da	y 5	Da	ay 6	Day 7	SUMN	IARY WATE	R QUALITY	DATA
	TRTMNT	Initial	Final	MEAN	S.D.	MIN.	MAX.												
	С	7.91	8.09	7.72	7.83	7.65	8.06	7.68	7.70	7.84	7.97	7.84	8.09			7.87	0.16	7.65	8.09
	1	7.89	8.14	7.70	7.96	7.65	8.12	7.68	7.84	7.82	8.00	7.82	8.09			7.89	0.17	7.65	8.14
pH (S.U.)	2	7.85	8.06	7.66	7.96	7.65	8.15	7.66	7.75	7.79	8.00	7.78	8.10			7.87	0.18	7.65	8.15
pri (3.0.)	3	7.78	8.09	7.60	7.99	7.61	8.23	7.63	7.85	7.76	7.96	7.72	7.99			7.85	0.20	7.60	8.23
	4	7.61	8.00	7.49	7.88	7.49	8.18	7.55	7.83	7.64	7.86	7.57	7.90			7.75	0.22	7.49	8.18
	5	7.26	7.60	7.25	7.65	7.28	7.86	7.34	7.48	7.39	7.51	7.20	7.47			7.44	0.19	7.20	7.86
	С	25	25	24	24	24	25	25	25	25	24	24	24			25	0.5	24	25
	1	25	25	24	24	24	25	25	25	25	24	24	24			25	0.5	24	25
Temp.	2	25	25	24	24	24	25	25	25	25	24	24	24			25	0.5	24	25
(o C)	3	25	25	24	24	24	25	25	25	25	24	24	24			25	0.5	24	25
	4	25	25	24	24	25	25	25	25	25	24	24	24			25	0.5	24	25
	5	25	25	24	25	25	25	25	25	25	24	24	24			25	0.5	24	25
	С	8.2	7.7	8.3	7.9	7.9	8.0	8.0	7.5	8.0	7.8	8.3	8.4			8.0	0.3	7.5	8.4
	1	8.2	7.7	8.3	8.0	7.7	8.1	8.0	7.5	8.0	7.8	8.3	8.4			8.0	0.3	7.5	8.4
Diss.	2	8.2	7.7	8.3	8.0	7.5	8.1	8.0	7.5	8.0	7.8	8.3	8.4			8.0	0.3	7.5	8.4
Oxygen (mg/l)	3	8.2	7.7	8.3	8.1	7.3	8.2	8.1	7.6	8.0	8.0	8.3	8.4			8.0	0.3	7.3	8.4
	4	8.2	7.8	8.3	8.0	7.3	8.3	8.1	7.7	8.0	8.0	8.3	8.2			8.0	0.3	7.3	8.3
	5	8.2	7.7	8.3	8.2	7.4	8.1	8.1	7.6	8.0	8.0	8.3	8.3			8.0	0.3	7.4	8.3
	С	294		293		290		293		297		298				294	2.9	290	298
	1	290		287		285		286		289		295				289	3.6	285	295
Cond.	2	285		277		279		277		280		293				282	6.2	277	293
(uS/cm)	3	273		260		262		260		262		289				268	11.5	260	289
	4	244		222		227		221		223		273				235	20.5	221	273
	5	181		142		145		142		141		242				166	40.5	141	242
Repli	cate measured	S	С	S	F	S	В	S	E	S	J	S	G					ues >8.3 mg	ا/ر
	Initials	BJA	В	JA	RO	CD	A	G	A	G	В	JA	R	CD			) may occu netic activity	r due to of algal foc	od.
Changes (Initials, d	ate, specific																		
												TRT ID:		2	3	4	5		
ARC	A1301CCD											CONC:	6.25%	12.5%	25.0%	50.0%	100%		

Ceriodaphnia daily reproduction count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

Repro Day 5  0 16 0 0 0 0 16 0 18 0 0 0 18 0 0 0 18 0 0 10 12 0 14 0 14 0 14 0 14 0 11 0 12 0 14 0 11 0 12 0 14 0 11 0 12 0 14 0 15 0 16 0 17 18 0 18 0 18 0 18 0 18 0 18 0 18 0	Reproday 6       18       2       16       18       16       18       18       0       18       20       20       22       22       16       18       20       16       0       16       10       18       18       18       18       18       18       18       16       0       16       0       16       20       18       16       20       18       16       20       18       16       20       18	Repro Day 7	4th Broods Removed	TOTAL REPRO  32 26 30 33 31 40 32 33 34 22 35 28 38 39 29 34 40 26 42 39 30 33 29 26 29 20 31 31 31 31	SAMPLE COLI  SAMPLE  A  B  C  D  E  SAMPLE  SAMPLE  SAMPLE  1st USE DATE/TIME:  LAST USE DATE/TIME:  TIME 1st TO LAST USE:  SAMPLE:  1st USE DATE/TIME:  LAST USE DATE/TIME:  LAST USE DATE/TIME:	COLLECTION DATE & TIME  12/11/13 16:00  12/12/13 15:00  12/16/13 12:15   GING  A  12/12/13 11:45  12/12/13 11:45  19h 45m  (TAC 36 h max)  0h 0m
16 0 0 0 16 0 18 0 0 18 0 0 0 18 0 0 10 12 0 14 0 14 0 14 0 14 0 14 0 11 0 12 0 14 0 11 0 12 0 14 0 11 0 12 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 14 0 0 0 14 0 0 0 0	2 16 18 16 18 18 18 0 18 18 0 18 18 20 20 22 22 22 16 18 18 20 0 22 22 22 16 18 18 20 0 16 0 16 0 16 10 18 18 18 18 18 22 20 16 10 11 18 18 18 18 18 18 20 0 16 10 11 18 18 18 18 18 18 18 18 18 18 18 18		20	26 30 33 31 40 32 33 34 22 35 28 38 39 29 34 40 26 42 39 30 33 29 26 29 29 20 31 31 31	SAMPLE  A B C D E  SAMPLE  SAMPLE  SAMPLE:  1st USE DATE/TIME:  TIME COLLECT TO 1st USE:  TIME 1st TO LAST USE:  SAMPLE:  1st USE DATE/TIME:	COLLECTION DATE & TIME  12/11/13 16:00  12/12/13 15:00  12/16/13 12:15   CGING  A  12/12/13 11:45  12/12/13 11:45  19h 45m  (TAC 36 h max)  Oh 0m  (TAC MAX 72 h)  B  12/13/13 11:56
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						(TAC MAX 72 h)
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12	0			17	TIME COLLECT TO 1st USE:	0
BJA	RCD					(TAC 36 h max)
12/17/13 12:12	12/18/13 13:16				TIME 1st TO LAST USE:	0
С						(TAC MAX 72 h)
6 50% & 100% a	dult ceriodaphia	trapped in				
	0 14 10 0 0 0 0 0 12 0 12 0 12 0 12 C	0       16         14       0         10       0         0       14         0       12         0       12         12       0         0       10         12       0         0       14         12       0         BJA       RCD         12/17/13 12:12       12/18/13 13:16         C       12/18/13 13:16	0       16         14       0         10       0         0       14         0       12         0       12         0       12         12       0         0       10         12       0         0       14         12       0         BJA       RCD         12/17/13 12:12       12/18/13 13:16	0 16 14 0 10 0 0 14 14 0 14 0 12 0 12 0 12 0 12 12 0 0 10 12 12 0 10 12 12 0 BJA RCD 12/17/13 12:12 12/18/13 13:16 C	0       16       28         14       0       22         10       0       23         0       14       14       19         0       12       22         0       12       22         0       12       27         12       0       18         0       10       21         12       0       22         0       14       28         12       0       17         BJA       RCD         12/17/13 12:12       12/18/13 13:16         C       0       0	0       16       28       SAMPLE:         14       0       22       1st USE DATE/TIME:         10       0       23       LAST USE DATE/TIME:         0       14       14       19       TIME COLLECT TO 1st USE:         0       12       22       TIME 1st TO LAST USE:         0       12       27       18         12       0       18       0         0       10       21       SAMPLE:         12       0       22       1st USE DATE/TIME:         0       14       28       LAST USE DATE/TIME:         12       0       17       TIME COLLECT TO 1st USE:         BJA       RCD         12/17/13 12:12       12/18/13 13:16       TIME 1st TO LAST USE:

Ceriodaphnia daily survival count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	#Live	#Live	#Live	#Live	#Live	#Live	#Live	#Live	MALE OR	TOTAL	REPRO/
	Α	<b>Day 0</b>	<b>Day 1</b>	<b>Day 2</b>	<b>Day 3</b>	<b>Day 4</b>	<b>Day 5</b>	<b>Day 6</b>	FINAL 1	<b>FEMALE</b> F	REPRO 32	SURV FEM
С	В	1	1	1	1	1	1	1	1	F	26	26
	С	1	1	1	1	1	1	1	1	F	30	30
Lab	D	1	1	1	1	1	1	1	1	F	33	33
Control	E	1	1	1	1	1	1	1	1	F	31	31
	F	1	1	1	1	1	1	1	1	F	40	40
	G H	1	1	1	1	1	1	1	1	F	32	32 33
	1.	1	1	1	1	1	1	1	1	F F	34	34
	J	1	1	1	1	1	1	1	1	F	22	22
	Α	1	1	1	1	1	1	1	1	F	35	
#1	В	1	1	1	1	1	1	1	1	F	28	
	C	1	1	1	1	1	1	1	1	F _	38	
6.25%	D E	1	1	1	1	1	1	1	1	F	39 29	
	F	1 1	1	1	1	1	1	1	1	F	29 34	
	G	1	1	1	1	1	1	1	1	F	40	
	Н	1	1	1	1	1	1	1	1	F	26	
	ı	1	1	1	1	1	1	1	1	F	42	
	J	1	1 .	1	1	1	1	. 1	1	F	39	
# 2	A B	1	1	1	1	1	1	1	1	F	30	-
# 2	C	1	1	1	1	1	1	1	1	F	29	
12.5%	D	1	1	1	1	1	1	1	1	F	26	
	E	1	1	1	1	1	1	1	1	F	29	
	F	1	1	1	1	1	1	1	1	F	29	
	G	1	1	1	1	1	1	1	1	F	30	
	H	1	1	1	1	1	1	1	1	F	22	
	<b> </b>	1	1	1	1	1	1	1	1	F	33	
	J	1	1	1	1	1	1	1	1	F	42 35	
# 3	В	1	1	1	1	1	1	1	1	F	20	
	С	1	1	1	1	1	1	1	1	F	31	
25.0%	D	1	1	1	1	1	1	1	1	F	31	
	E	1	1	1	1	1	1	1	1	F	31	
	F	1	1	1	1	1	1	1	1	F	39	
	G H	1 1	1	1	1	1	1	1	1	F	33 32	
	ı	1	1	1	1	1	1	1	1	F	25	
	J	1	1	1	1	1	1	1	1	F	20	
	A	1	1	1	1	1	1	1	1	F	32	
# 4	В	1	1	1	1	1	1	1	1	F	15	
E0 00/	С	1	1	1	1	1	1	1	1	F	27	
50.0%	D E	1	1	1	1	1	1	1	1	F	23	
	F	1	1	1	1	1	1	1	1	F	14	
	G	1	1	1	1	1	1	1	1	F	24	
	Н	1	1	1	1	1	1	1	1	F	30	
	I	1	1	1	1	1	1	1	1	F -	28	
	J	1	1	1	1	1	1	1	1	F	22	
# 5	A B	1	1 1	1	1	1	1	1	1	F	23 19	
	С	1	1	1	1	1	1	1	1	F	22	
100%	D	1	1	1	1	1	1	1	1	F	22	
	E	1	1	1	1	1	1	1	1	F	27	
	F	1	1	1	1	1	1	1	1	F	18	
	G H	1	1	1	1	1	1	1	1	F	21	
	ı	1	1 1	1	1	1	1	1	1	F	22 28	
	J	1	1	1	1	1	1	1	1	F	17	
		See Repr	oduction Sheet	for Renewal Ir	nformation		See ToxC	Calc printout for	summary surv	vival & reproduc		
CHANGES 8												
NOTES (INIT	CIFIC											
CHANGE MA		01.0	maria la companya di santa di	TAC 000/	400	2/ 2	ivine a service de	with O by the Company	TAC 000/	00		
ARCA1301	ICCD	% Co	ntrol survival (1	AU 80% MIN):	100	% Surv	iving controls w	vith 3 broods (T	AC 60% MIN):	90		

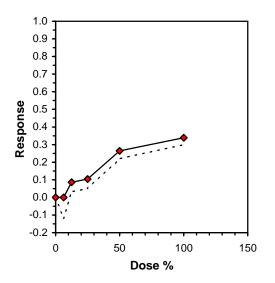
			Cerioda	phnia Su	rvival and	Reprod	uction Tes	t-Repro	duction	
Start Date:			Test ID:	ARCA130	1		Sample ID	) <u>:</u>		
End Date:			Lab ID:	CBI			Sample Ty	/pe:		
Sample Date:			Protocol:	EPAF 94-I	EPA Freshwater Test Species: CD-0				CD-Cerioo	laphnia dubia
Comments:	DATA EN	TERED B	Y PB							
Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	32.000	26.000	30.000	33.000	31.000	40.000	32.000	33.000	34.000	22.000
6.25	35.000	28.000	38.000	39.000	29.000	34.000	40.000	26.000	42.000	39.000
12.5	30.000	33.000	29.000	26.000	29.000	29.000	30.000	22.000	33.000	42.000
25	35.000	20.000	31.000	31.000	31.000	39.000	33.000	32.000	25.000	20.000
50	32.000	15.000	27.000	23.000	29.000	14.000	24.000	30.000	28.000	22.000
100	23.000	19.000	22.000	22.000	27.000	18.000	21.000	22.000	28.000	17.000

			•	Transform: Untransformed					1-Tailed		Isotonic		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean	
CONTROL	31.300	1.0000	31.300	22.000	40.000	15.289	10				33.150	1.0000	
6.25	35.000	1.1182	35.000	26.000	42.000	15.993	10	-1.557	2.287	5.436	33.150	1.0000	
12.5	30.300	0.9681	30.300	22.000	42.000	17.188	10	0.421	2.287	5.436	30.300	0.9140	
25	29.700	0.9489	29.700	20.000	39.000	20.880	10	0.673	2.287	5.436	29.700	0.8959	
*50	24.400	0.7796	24.400	14.000	32.000	24.982	10	2.903	2.287	5.436	24.400	0.7360	
*100	21.900	0.6997	21.900	17.000	28.000	16.173	10	3.954	2.287	5.436	21.900	0.6606	

Auxiliary Tests					Statistic		Critical		Skew	Kurt
Kolmogorov D Test indicates norn		0.97969		1.035		-0.2544	-0.1847			
Bartlett's Test indicates equal vari	ances (p =	0.66)			3.25149		15.0863			
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	<mark>25</mark>	50	35.3553	4	5.43552	0 <mark>.17366</mark>	229.427	28.2519	9.1E-06	5, 54

				Linea	r Interpolation (200 Resan	nples)
Point	%	SD	95% C	:L	Skew	
IC05	9 885	6 213	7 896	29 180	1 7035	

IC05	9.885	6.213	7.896	29.180	1.7035
IC10	22.188	9.126	9.547	37.792	0.3383
IC15	32.182	10.176	11.196	50.512	-0.0823
IC20	40.000	11.450	20.185	65.098	0.4079
IC25	4 <mark>7.818</mark>				
IC40	>100				
IC50	>100				



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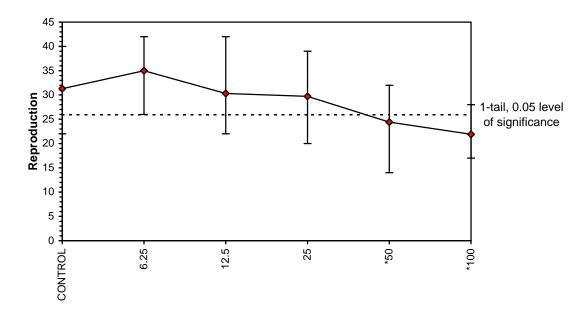
Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: Test ID: ARCA1301 Sample ID: End Date: Lab ID: CBI Sample Type:

Sample Date: Protocol: EPAF 94-EPA Freshwater Test Species: CD-Ceriodaphnia dubia

Comments: DATA ENTERED BY PB

#### **Dose-Response Plot**



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# Fathead minnow test set up bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

Test chamber:	1000 ml P	oly Beaker	~	Illumination & photoperiod:	50-100 ft	-c 16L:8D	
		Other:		Number of replicates/treatment:	4		
Test solution vol. (25	50 ml min):	500 ml:	<b>✓</b>	Initial number animals/replicate:	10		
		Other (ml):					
CHANGES & NOTES DATE, SPECIFIC CHA MADE	•						

SPECIES:		Pimep	hales promelas			
ACCLIMATION WATER:		Mod. Hard Synth	netic Freshwater			
FEEDING PRIOR TO TEST:	Arter	mia nauplii (<24 l	n old) ad libitum			
FEEDING DURING TEST:	Artemia na	uplii (<24 h old, -	~0.15 ml) 2x/day			
SOURCE:		CE	BI Stock cultures			
ACCLIMATION TEMP (o C ):			25			
HATCH START DATE & TIME:			12/11/13 17:00			
HATCH END DATE & TIME:			12/12/13 8:45			
DATE/TIME WATER ADDED:		12/12/13 11:52				
DATE/TIME ANIMALS ADDED:		12/12/13 12:1				
ANIMAL AGE WINDOW:		15h 45m				
MAX AGE AT TEST START (TA	C 24 h MAX):		19h 11m			
TEST SET UP BY:			AG			
TEST ID:		ARCA1301CPF	)			
PEER REVIEW BY (Initial/Date	):	GB. PB	12/20/13 13:53			
ARCA1301CPP						

# Fathead minnow daily water quality bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

		Day 0	Da	y 1	Da	y 2	Da	y 3	Da	y 4	Da	ıy 5	Da	ay 6	Day 7	SUMM	MARY WATE	R QUALITY	DATA
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.
	С	7.98	7.74	7.84	7.50	7.78	7.40	7.71	7.36	7.81	7.45	7.93	7.48	7.85	7.23	7.65	0.24	7.23	7.98
	1	7.96	7.65	7.80	7.36	7.74	7.21	7.64	7.22	7.83	7.33	7.86	7.36	7.80	7.23	7.57	0.27	7.21	7.96
pH (S.U.)	2	7.93	7.66	7.75	7.41	7.74	7.12	7.64	7.20	7.74	7.27	7.75	7.30	7.80	7.23	7.54	0.27	7.12	7.93
pii (3.0.)	3	7.85	7.62	7.71	7.31	7.71	7.11	7.58	7.13	7.72	7.19	7.74	7.22	7.72	7.20	7.49	0.27	7.11	7.85
	4	7.69	7.52	7.63	7.21	7.58	7.06	7.54	7.11	7.69	7.18	7.60	7.09	7.57	7.20	7.41	0.24	7.06	7.69
	5	7.27	7.24	7.35	7.00	7.35	6.81	7.31	6.89	7.36	7.17	7.27	6.87	7.19	7.15	7.16	0.19	6.81	7.36
	С	25	24	25	25	24	24	25	24	25	24	24	24	24	24	24	0.5	24	25
	1	25	24	25	25	24	24	25	24	25	24	24	24	24	24	24	0.5	24	25
Temp.	2	25	24	25	25	24	24	25	24	25	24	24	24	24	24	24	0.5	24	25
(o C)	3	25	24	25	25	24	24	25	24	25	24	24	24	24	24	24	0.5	24	25
	4	25	24	25	25	24	24	25	24	25	24	24	24	24	24	24	0.5	24	25
	5	25	24	25	25	24	24	25	24	25	24	24	24	24	24	24	0.5	24	25
	С	8.2	8.0	8.2	7.5	7.4	7.2	7.9	7.4	7.6	7.3	8.0	7.1	7.8	7.6	7.7	0.4	7.1	8.2
	1	8.2	8.0	8.2	7.0	7.3	7.0	7.8	7.2	7.6	7.0	8.0	7.1	7.8	7.7	7.6	0.5	7.0	8.2
Diss.	2	8.2	8.0	8.2	7.0	7.3	6.8	7.7	7.0	7.5	6.8	8.0	6.8	7.7	7.6	7.5	0.5	6.8	8.2
Oxygen (mg/l)	3	8.2	7.9	8.2	6.7	7.2	6.3	7.6	6.9	7.4	6.7	7.9	6.8	7.6	7.7	7.4	0.6	6.3	8.2
	4	8.2	7.8	8.2	6.7	7.3	6.3	7.7	6.7	7.4	6.6	7.9	6.7	7.5	7.7	7.3	0.6	6.3	8.2
	5	8.2	7.6	8.2	6.7	7.3	6.2	7.8	6.5	7.5	6.5	7.9	6.7	7.4	7.6	7.3	0.7	6.2	8.2
	С	294		293		288		291		293		297		292		293	2.8	288	297
	1	291		285		284		284		289		293		294		289	4.3	284	294
Cond.	2	283		276		276		276		280		290		293		282	7.0	276	293
(uS/cm)	3	270		259		260		259		262		284		288		269	12.4	259	288
	4	241		227		225		220		223		263		275		239	21.7	220	275
	5	176		150		145		136		139		218		240		172	41.5	136	240
Rep	olicate measured	Α	В	D	С	В	D	С	Α	D	С	В	Α	С	Α				
	Initials	AG	GB	BJA	RCD	RCD	RCD	AG	GB	AG	GB	BJA	GB	RCD	РВ				
Changes (Initials, d	late, specific											1							
		Tes	st Aerated?	No				est conc. @				TRT ID:	1	2	3	4	5		
ARC	A1301CPP		Date & Tim	e Air Start:			Total live h	ighest conc	.@ aeration			CONC(%):	6.25%	12.5%	25.0%	50.0%	100%		

# Fathead minnow daily biological measurements bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

							•						
TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live Day 7	Total Dry Wt (mg)	Tare Wt (mg)	Wt Count	Pan Number
С	Α	10	10	10	10	10	10	10	10	14.51	8.28	10	1
	В	10	10	10	10	10	10	10	10	13.78	8.85	10	2
Lab	С	10	10	10	10	10	10	10	10	14.29	9.57	10	3
Control	D	10	10	10	10	10	10	10	10	14.79	9.06	10	4
#1	A	10	10	10	10	10	10	10	10	14.18	8.30	10	5
6.25%	В	10	10	10	10	10	10	10	10	13.79	8.01	10	6
Vol. Effl:	С	10	10	10	10	10	10	10	10	14.79	8.63	10	7
75 ml	D	10	10	10	10	10	10	10	10	13.01	7.14	10	8
# 2	Α	10	10	10	10	10	10	10	10	12.97	7.44	10	9
12.5%	В	10	10	10	10	10	10	10	10	13.30	7.73	10	10
Vol. Effl:	С	10	10	10	10	10	10	10	10	13.51	8.64	10	11
150 ml	D	10	10	10	10	10	10	10	10	11.87	6.52	10	12
# 3	Α	10	10	10	10	10	10	10	10	15.27	10.41	10	13
25.0%	В	10	10	10	10	10	9	8	8	13.98	9.79	10	14
Vol. Effl:	С	10	10	10	10	10	10	10	10	14.82	9.68	10	15
300 ml	D	10	10	10	10	10	9	3	3	10.31	8.20	10	16
# 4	Α	10	10	10	10	10	10	10	10	13.39	8.02	10	17
50.0%	В	10	10	10	9	8	8	8	8	14.88	10.28	10	18
Vol. Effl:	С	10	10	10	10	9	9	9	9	14.97	9.18	10	19
600 ml	D	10	10	10	10	10	10	10	9	15.87	10.53	10	20
# 5	Α	10	10	10	10	10	10	10	9	15.05	10.35	10	21
100%	В	10	10	10	10	9	9	9	9	14.70	9.64	10	22
Vol. Effl:	С	10	10	10	10	10	10	8	8	14.81	10.74	10	23
1200 ml	D	10	10	10	10	10	10	10	10	17.68	12.08	10	24
IN	ITIALS:	AG	BJA	RCD	AG	AG	AG	RCD	AG	GB	GB		c printout for
DATE 8	& TIME:	12/12/13 12:11	12/13/13 13:18	12/14/13 13:07	12/15/13 12:46	12/16/13 11:53	12/17/13 13:20	12/18/13 11:20	12/19/13 12:05	12/20/13 13:52	12/13/13 16:44		survival & ss data
SAMPLE	USED:	А	В	В	В	В	С	С	100 mg wt ck:	99.99	99.99	Test Duration:	6d 23h 54m
CHANGES 8	<u> </u>	Fuzzy dead fish	zy dead fish Day 3 4-B; Day 4 4-B, 4-C, 5-B. Fuzzy dead fish day 6 3-B, 3-D, 5-C. RCD 12/18/13.										

CHANGES &
NOTES (INITIALS,
DATE, SPECIFIC CHANGE MADE

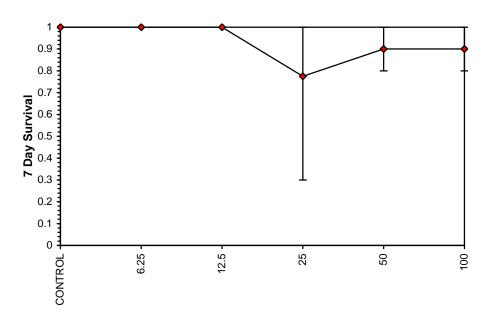
	MEAN % CONT	ROL SURVIVAL	(TAC 80% MIN): 100	AVG. DRY WT. PER S		
		COLLECTION				TIME 1st TO LAST USE
	SAMPLE	DATE/TIME	1st USE DATE & TIME	LAST USE DATE & TIME	TIME COLLECT-1ST USE (TAC MAX 36h)	(TAC MAX 72 h)
	Α	12/11/13 16:00	12/12/13 12:11	12/12/13 12:11	20h 11m	0h 0m
	В	12/12/13 15:00	12/13/13 13:18	12/16/13 11:53	22h 18m	70h 35m
	С	12/16/13 12:15	12/17/13 13:20	12/18/13 11:20	25h 5m	22h 0m
					0	0
ARCA1301CPP					0	0

	Larval Fish Growth and Survival Test-7 Day Survival											
Start Date:			Test ID:	ARCA1301PP	Sample ID:							
End Date:			Lab ID:	CBI	Sample Type:							
Sample Date:			Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas						
Comments:	DATA EN	TERED E	BY PB									
Conc-%	1	2	3	4								
CONTROL	1.0000	1.0000	1.0000	1.0000								
6.25	1.0000	1.0000	1.0000	1.0000								
12.5	1.0000	1.0000	1.0000	1.0000								
25	1.0000	0.8000	1.0000	0.3000								
50	1.0000	0.8000	0.9000	0.9000								
100	0.9000	0.9000	0.8000	1.0000								

			Tra	ansform:	Arcsin So	Rank	1-Tailed			
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	
CONTROL	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4			
6.25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00	
12.5	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00	
25	0.7750	0.7750	1.1277	0.5796	1.4120	34.816	4	14.00	10.00	
50	0.9000	0.9000	1.2543	1.1071	1.4120	9.935	4	12.00	10.00	
100	0.9000	0.9000	1.2543	1.1071	1.4120	9.935	4	12.00	10.00	

Auxiliary Tests					Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non	-normal dis	tribution (p	> <= 0.01)		0.70683	0.884	-1.4805	6.76939
Equality of variance cannot be co	nfirmed							
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU				
Steel's Many-One Rank Test	100	>100		1				

# Dose-Response Plot



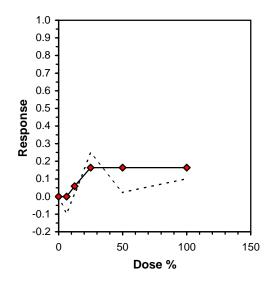
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			Laı	rval Fish Growth and Surv	ival Test-7 Day Bio	omass
Start Date:			Test ID:	ARCA1301PP	Sample ID:	
End Date:			Lab ID:	CBI	Sample Type:	
Sample Date:			Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA EN	TERED I	BY PB			
Conc-%	1	2	3	4		
CONTROL	0.6230	0.4930	0.4720	0.5730		
6.25	0.5880	0.5780	0.6160	0.5870		
12.5	0.5530	0.5570	0.4870	0.5350		
25	0.4860	0.4190	0.5140	0.2110		
50	0.5370	0.4600	0.5790	0.5340		
100	0.4700	0.5060	0.4070	0.5600		

				Transforn	n: Untran	sformed			1-Tailed		Isotonic		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean	
CONTROL	0.5403	1.0000	0.5403	0.4720	0.6230	13.006	4				0.5663	1.0000	
6.25	0.5923	1.0963	0.5923	0.5780	0.6160	2.779	4	-1.014	2.410	0.1236	0.5663	1.0000	
12.5	0.5330	0.9866	0.5330	0.4870	0.5570	6.027	4	0.141	2.410	0.1236	0.5330	0.9413	
*2 <mark>5</mark>	0.4075	0.7543	0.4075	0.2110	0.5140	33.602	4	2.589	2.410	0.1236	0.4736	0.8364	
50	0.5275	0.9764	0.5275	0.4600	0.5790	9.378	4	0.249	2.410	0.1236	0.4736	0.8364	
100	0.4858	0.8991	0.4858	0.4070	0.5600	13.221	4	1.063	2.410	0.1236	0.4736	0.8364	

Auxiliary Tests					Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)					0.92622		0.884		-1.082	2.67736
Bartlett's Test indicates equal vari	ances (p =	0.04)			11.6739		15.0863			
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	12.5	25	17.6777	8	0.12359	0 <mark>.2287</mark> 7	0.0156	0.00526	0.04001	5, 18

				Linea	ar Interpolatio	n (200 Resamples)
Point	%	SD	95% CI	_(Exp)	Skew	
IC05	11.572	7.964	6.005	30.537	5.4051	
IC10	17.418					
IC15	23.374					1.0
IC20	>100					0.9
IC25	>100					0.8
IC40	>100					
IC50	>100					0.7
						0.0



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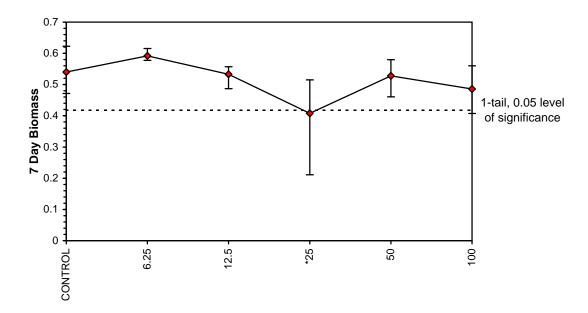
Larval Fish Growth and Survival Test-7 Day Biomass

Start Date: Test ID: ARCA1301PP Sample ID: End Date: Lab ID: CBI Sample Type:

Sample Date: Protocol: EPAF 94-EPA Freshwater Test Species: PP-Pimephales promelas

Comments: DATA ENTERED BY PB

#### **Dose-Response Plot**



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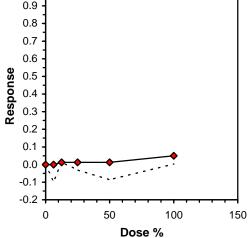
			La	rval Fish Growth and Su	rvival Test-7 Day G	rowth
Start Date:			Test ID:	ARCA1301PP	Sample ID:	
End Date:			Lab ID:	CBI	Sample Type:	
Sample Date:			Protocol:	EPAF 94-EPA Freshwate	Test Species:	PP-Pimephales promelas
Comments:	DATA EN	TERED I	BY PB			
Conc-%	1	2	3	4		
CONTROL	0.6230	0.4930	0.4720	0.5730		
6.25	0.5880	0.5780	0.6160	0.5870		
12.5	0.5530	0.5570	0.4870	0.5350		
25	0.4860	0.5238	0.5140	0.7033		
50	0.5370	0.5750	0.6433	0.5933		
100	0.5222	0.5622	0.5088	0.5600		

				Transforn	n: Untran	sformed			1-Tailed		Isotonic		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean	
CONTROL	0.5403	1.0000	0.5403	0.4720	0.6230	13.006	4				0.5663	1.0000	
6.25	0.5923	1.0963	0.5923	0.5780	0.6160	2.779	4	-1.317	2.410	0.0952	0.5663	1.0000	
12.5	0.5330	0.9866	0.5330	0.4870	0.5570	6.027	4	0.184	2.410	0.0952	0.5590	0.9872	
25	0.5568	1.0306	0.5568	0.4860	0.7033	17.783	4	-0.418	2.410	0.0952	0.5590	0.9872	
50	0.5872	1.0868	0.5872	0.5370	0.6433	7.525	4	-1.188	2.410	0.0952	0.5590	0.9872	
100	0.5383	0.9964	0.5383	0.5088	0.5622	5.002	4	0.049	2.410	0.0952	0.5383	0.9506	

Auxiliary Tests					Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates norm	nal distribu	tion $(p > 0)$	.01)		0.92545		0.884		1.11484	2.14093
Bartlett's Test indicates equal vari	ances (p =	0.07)			10.29		15.0863			
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.09519	0.17619	0.00268	0.00312	0.52645	5, 18

	Linear Interpolation (200 Resamples)										
Point	%	SD	95% CL(Exp)	Skew							
IC05	>100										
IC10	>100										
IC15	>100				1.0						
IC20	>100				0.9						
IC25	>100				0.8						
IC40	>100				4						
IC50	>100				0.7						
					0.6 -						
					<b>8</b> 0.5						

Note: Net weight analyzed to examine effect of replicatespecific mortality (conc 25%) on biomass endpoint.



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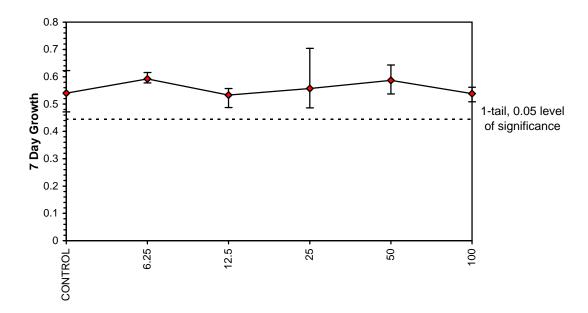
Larval Fish Growth and Survival Test-7 Day Growth

Start Date: Test ID: ARCA1301PP Sample ID: End Date: Lab ID: CBI Sample Type:

Sample Date: Protocol: EPAF 94-EPA Freshwater Test Species: PP-Pimephales promelas

Comments: DATA ENTERED BY PB

#### **Dose-Response Plot**



Effluent and Dilution Water Log (Freshwater Tests). FWEFFL061013

	Lindent and Dilution water Log (Freshwater rests). Twelf Loorons						SUM	IMARY WATER	QUALITY DA	ТА					
Initial	Bottle(1):	A1	B1	C1							MEAN	S.D.	MIN.	MAX.	PARAMETER
sample charac-	Arrival Temp. (oC, from CoC):	1	1	1							1	0.0	1	1	Arrival Temp.
terization	TRC (mg/l)(2):	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></dl<>											
	TRC Corrected(2):														
	Hardness (mg/l):	70	64	54							63	8.1	54	70	Hardness (mg/l)
	Alkalinity (mg/l):	24	22	20							22	2.0	20	24	Alkalinity (mg/l)
	NH3-N (mg/l):	<1.0	<1.0	<1.0											
	Color/Appearance(3):	CY	CY	CY											
	Obvious odor?	NO	NO	NO											
	Date & Time:	12/12/13 10:20	12/13/13 11:12	12/17/13 10:52											
	Initials:	РВ	GB	GB											
Sample	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
prep measure-	Bottle(s):	A1	B1,2	B1,2	B1,2	B1,2	C1,2	C1,2							
ments	Prep. Temp. (oC):	25	25	25	25	26	24	25			25	0.6	24	26	Temp. (oC)
	D.O. (mg/l) After Warming:	9.2	8.9	9.6	9.3	9.0	8.9	9.0							
	Aeration Time (min):	2	2	2.5	2.5	1.5	1	1							
	Adjusted D.O. (mg/l):	8.2	8.2	8.1	8.1	8.1	8.3	8.0			8.1	0.1	8.0	8.3	D.O. (mg/l)
	Final pH (S.U.):	7.24	7.31	7.34	7.31	7.41	7.19	7.23			7.29	0.08	7.19	7.41	pH (S.U.)
	Conductivity (uS/cm)(4):	177	140	NA	NA	NA	242	NA			186	51.6	140	242	Cond. (uS/cm)
	Final TRC (mg/l)(5):	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.							
	Sample Filtered (60 um)?	~	~	<b>✓</b>	~	~	<b>✓</b>	~							
	Date & Time:	12/12/13 11:10	12/13/13 11:26	12/14/13 11:00	12/15/13 11:24	12/16/13 11:07	12/17/13 11:23	12/18/13 10:54							
	Initials:	BJA	BJA	RCD	AG	AG	BJA	RCD							
Dilution	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
water	Vat Number:	3	2	2	2	1	1	1							
	Temperature (oC):	25	25	25	25	25	25	24			25	0.4	24	25	Temp. (oC)
	Conductivity (uS/cm):	294	293	297	294	296	301	300			296	3.1	293	301	Cond. (uS/cm)
	D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.2	8.3			8.2	0.0	8.2	8.3	D.O. (mg/l)
	pH (S.U.):	7.89	7.85	8.01	7.78	7.93	7.91	8.05			7.92	0.09	7.78	8.05	pH (S.U.)
	Hardness (mg/l):	84	90	90	90	96	96	96			92	4.5	84	96	Hardness (mg/l)
	Alkalinity (mg/l):	60	57	57	57	58	58	58			58	1.1	57	60	Alkalinity (mg/l)
	Date & Time:	12/12/13 8:40	12/13/13 8:30	12/14/13 8:50	12/15/13 8:45	12/16/13 8:45	12/17/13 8:20	12/18/13 8:30							
	Initials:	AG	GB	RCD	RCD	GB	GB	RCD							
	Changes & Notes (Initials, date, specific change or notes)														
	Peer review Initial/Date:	AG. PB	12/22/13 16:35	DILUTION WATER TYPE:		entire sample bottle II solids (SI-slight, M-mo	D. 2) TRC MDL 0.02 m oderate, H-heavy), Y-y	ig/l; QL 0.22 mg/l. Corre	ected value if Mn, Cr	on chain of custody AND potential positive interfer grey, Or-orange. 4) Me	ence. Corrected usin	ng KI and NaAsO2.	3) C-clear, O-opaq	ue, T-turbid, S-	
PROJECT ID:	ARCA1301	ADDITIONAL EFFLUENT TREATMENT:				present in initial chara	acterization.								



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# SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF20111 Rev. 8/7/13)

Lab Sample ID (Lab Use Only)  A A A A A Y Y N N N Spl  CBI Login # 13-1024
FACILITY INFORMATION
NAME JOINT BASIN CORPORATION CONTACT & PHONE # 703 465 4213
PERMIT NO VACOO1872 OUTFALL # OR LOCATION OOL
SAMPLE SAMPLE DECHLORINATED? NO DECHLORINATED? NO DECHLORINATED? NO DECHLORINATED?
SPECIES OR CHRONIC LA CUTE CHRONIC CHR
REQUESTED: SPECIES OR EPA METH # P. Prometers ACUTE   CHRONIC
OTHER TESTS:
A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.
GRAB SAMPLE INFORMATION
SAMPLE DATE SAMPLE VOLUME SAMPLE VOLUME
COMPOSITE SAMPLE INFORMATION
COMPOSITE SAMPLE INFORMATION  SAMPLE START DATE & TIME 12 1013 1600 DATE & TIME 12 1113 1600 TEMP. (°C) 3°C AMBI
TIME OR LOW NUMBER 1/ VOL (ml) TIME
COMPOSITE
INFORMATION SET VOLUME SUBSAMPLE COP AL SET VOLUME 15,000 GAL/SAME VOLUME 9.6 L TOTAL 9.6
FIELD MEASUREMENTS
DISCHARGE DISCHARGE SAMPLE SAMPLE DATE/TIME INITIALS TEMP (°C) pH (S.U.) TEMP (°C) pH (S.U.) TRC (mg/l) (e.g. 02/23/00 1835)
4.5°C 6.95 8.8°C 7.4 0.00 mg/L 12/11/13 140 BSD MAR
MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.
COMMENTS:
Cotaline Tunier - ARCADIS of State 12/11/18
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)
ARELINQUISHED BY DATE TIME RECEIVED BY
12/11/13 1700
12/12/13 1020 P. Blus CO
SAMPLES MUST ARRIVE AT LAB BY NOON.
CONDITION ON ARRIVAL: ACCEPTABLE OTHER
SAMPLE TEMP: (°C) / ARRIVED ON ICE? YN_ CUSTODY SEAL: INTACT; BROKEN_ ABSENT
NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidate.



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# SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF20111 Rev. 8/7/13)

Lab Sample ID (Lab Use Only)	A A Y Project ID	3 0 1	- <u>B</u>	CBI Login #/	3-1029
FACILITY INFORMATION					
CLIENT/FACILITY JBC Fairfax 7	Terminal	CONTACT - & PHONE #	03.46	5.4213	3
PERMIT NO VAOCO1877.			OUTFALL OR LOCA		
SAMPLE CHLORINATED? NO DECHLORI	NATED? NO	IF CHLORINE PR PERMIT SPECIF			,
SPECIES OR TESTS EPA METH #		O dubi	_ ACI	JTE 🗆	CHRONIC 🗹
REQUESTED: SPECIES OR EPA METH #		P. grome	es ACI	JTE 🗆	CHRONIC 🗹
OTHER TESTS:					
A SPECIFIC DILUTION SERIES MAY BE REQUIRED PRIOR TESTING, WILL BE USED UNLESS INDICATE	IN THE PERMIT. A DEFA	ULT SERIES OF 100	50, 25, 12.5 AND	6.3%, OR CONCEN	NTRATIONS USED IN
	ED OTHERWISE. IF IN DC	JUB! PLEASE ATTA	CH A COPY OF AP	PLICABLE PERMI	IT PAGES.
GRAB SAMPLE INFORMATION SAMPLE DATE	SAMPLE TIME		SAMPLE	/OLUME	
COMPOSITE SAMPLE INFORMATIO					
SAMPLE START DATE & TIME 12/11/2013 16	SAMPLE END DATE & TIME (2	2/12/13	1500	AUTOSAMPLEI TEMP. (°C)	~ 3°C
TIME OR FLOW NUMBER PROPORTIONAL SUBSAMPLES	2 2 VOI	(mi)	00	TIME INCREMENT	
COMPOSITE	000	SET VOLUME FLOW	$\sim$	TOTAL VOLUM	33001
FOR VARIABLE VOLUME SUBSAMPLES BASED ON			SAMPLE AND FLO		
FIELD MEASUREMENTS					
		MPLE SAM S.U.) TRC		ATE/TIME 02/23/00 1835)	INITIALS
5.4 7.11 2	0 6.	89 0.0	20 12/1	2413	MAR
MEASUREMENTS MUST BE TAKEN WITHIN 15 MIN	NUTES OF SAMPLE OR LA	AST SUBSAMPLE CO	LLECTION.	1600	
COMMENTS:					
MEREDITH PLAETZ		Merca	ath le	WT	12/12/13
(PRINTED NAME/AFFILIATION SAM	MPLER/ANALYST)		(SIGNATU	RE)	(DATE)
RELINQUISHED BY	DATE	TIME		RECEIVED BY	Called
Marodith Part	12/12/13	H6: 50	and the second second	Constant Constant	
The contract of the contract o	12(13/13	1100	J.B.		
SHIPPING METHOD: UPS FEDEX_X HAND DELIVERY DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.					
CONDITION ON ARRIVAL: ACCEPTABLE OTHER					
SAMPLE TEMP: (°C) ARRIV	VED ON ICE? Y_	N_ CUSTO	DDY SEAL: IN	ITACT <u>~</u> BF	ROKEN ABSENT_
NOTE: It is the responsibility of the sampler is 36 h. Additional costs may be incurred by	to insure that sample	s are properly coll	ected, preserve	d (>0-6° C) and	shipped. Sample hold tin



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# SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF20111 Rev. 8/7/13)

(Lab Use Only)  ARCA 13 C 1 CBI Login # 23 - 1 C38	
A A A A Y Y N N A A Spl	<u>.</u>
FACILITY INFORMATION	
CLIENT/FACILITY JBC TErminal CONTACT & PHONE # 703 465 4213	
PERMIT NO VACOO1872 OUTFALL # OR LOCATION CO	
SAMPLE SAMPLE IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES CHLORINATED? NO PERMIT SPECIFY DECHLORINATION OF SAMPLES?	
SPECIES OR TESTS EPA METH # CHRONIC 12	
REQUESTED: SPECIES OR EPA METH # CHRONIC C	
OTHER TESTS:	
A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.	
GRAB SAMPLE INFORMATION	
SAMPLE DATE SAMPLE TIME SAMPLE VOLUME	
SAMPLE START SAMPLE INFORMATION  SAMPLE START SAMPLE END SAMPLE EN	
DATE & TIME 145/2013 1315 DATE & TIME 1414/2015 1215 TEMP. (°C) 5°C	
TIME OR FLOW NUMBER 17 VOL (ml) TIME INCREMENT INCREMENT	
COMPOSITE SET VOLUME 450 IN L SET VOLUME 7 000 GET VOLUME 2 GR	
FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET	
FIELD MEASUREMENTS  DISCHARGE   DISCHARGE   SAMPLE   SAMPLE   DATE/TIME   INITIALS	
TEMP (°C) pH (S.U.) TEMP (°C) pH (S.U.) TRC (mg/l) (e.g. 02/23/00 1835)	
85 6.8 5.0 6.39 0.00 141413 1358 MAR	
MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.	
COMMENTS:	
MELEDITH RACTZ MECOCITA ROCK 121161	>
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)	ر
RELINQUISHED BY DATE TIME RECEIVED BY	
Meredith 200tz 12/10/13 1400	
121713 1035 150	
SHIPPING METHOD: UPS FEDEX HAND DELIVERY DO NOT SHIP FEDEX STANDARD OVERNIG	łТ.
SAMPLES MUST ARRIVE AT LAB BY NOON	
CONDITION ON ARRIVAL: ACCEPTABLE OTHER	
CONDITION ON ARRIVAL: ACCEPTABLE OTHER SAMPLE TEMP: (°C) ARRIVED ON ICE? Y N CUSTODY SEAL: INTACT BROKEN ABSE	NT



APPENDIX D
Storm Event Data (January 3-6, 2009)

# History for KVAVIENN4 Merrifield area, Vienna, VA — Current Conditions

## Daily Summary for January 3, 2009

	Current:	High:	Low:	Average:	
Temperature:	<b>33.9</b> °F	<b>57.7</b> °F	<b>32.7</b> °F	<b>39.3</b> °F	
Dew Point:	<b>25.5</b> °F	19.5 °F	-5.0 °F	<b>4.0</b> °F	
Humidity:	71%	51%	19%	24%	
Wind Speed:	<b>0.0</b> mph	<b>10.9</b> mph	, <del>-</del>	<b>0.9</b> mph	
Wind Gust:	<b>0.0</b> mph	<b>10.9</b> mph	-	_	
Wind:	SSE	-	' <u>-</u> .	NNW	
Pressure:	<b>29.70</b> in	<b>29.87</b> in	<b>29.56</b> in		
Precipitation:	<b>0.00</b> in				

	High:	Low:	Average:
Temperature:	58.1 °F	21.3 °F	<b>37.7</b> °F
Dew Point:	<b>33.3</b> °F	-14.5 °F	6.1 °F
Humidity:	66.0%	19.0%	28.6%
Wind Speed:	12.3mph from the NNE	-	<b>1.6</b> mph
Wind Gust:	12.3mph from the NNE	• · · · · · · · · · · · · · · · · · · ·	-
Wind:			West
Pressure:	<b>30.10</b> in	<b>29.49</b> in	-
Precipitation:	<b>0.00i</b> n	again an ann an 1940 ann an 1940 an 19	a commence of the second secon

# **History for KVAVIENN4**

Merrifield area, Vienna, VA — Current Conditions

## Daily Summary for January 4, 2009

	Current:	High:	Low:	Average:	
Temperature:	33.9 °F	46.0 °F	27.8 °F	37.2 °F	
Dew Point:	<b>25.5</b> °F	<b>23.0</b> °F	-8.3 °F	<b>2.8</b> °F	
Humidity:	71%	50%	19%	24%	
Wind Speed:	<b>0.0</b> mph	<b>8.0</b> mph	-	<b>1.0</b> mph	
Wind Gust:	0.0mph	<b>8.0</b> mph	-		
Wind:	SSE	<b>-</b> .	-	South	
Pressure:	<b>29.70</b> in	<b>29.88</b> in	<b>29.68</b> in	÷	
Precipitation:	<b>0.00</b> in				

i	High:	Low:	Average:
Temperature:	58.1 °F	21.3 °F	37.7 °F
Dew Point:	33.3 °F	-14.5 °F	6.1 °F
Humidity:	66.0%	19.0%	28.6%
Wind Speed:	12.3mph from the NNE	-	1.6mph
Wind Gust:	12.3mph from the NNE		•
Wind:	<del>-</del>	-	West
Pressure:	<b>30.10</b> in	<b>29.49</b> in	
Precipitation:	0.00in		

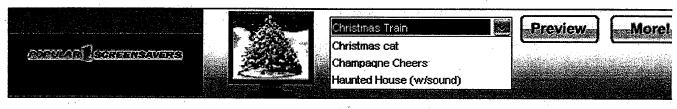
# **History for KVAVIENN4**

Merrifield area, Vienna, VA — Current Conditions

#### Daily Summary for January 5, 2009

•	Current:	High:	Low:	Average:
Temperature:	33.9 °F	<b>50.3</b> °F	<b>39.7</b> °F	<b>43.7</b> °F
Dew Point:	<b>25.5</b> °F	33.3 °F	0.0 °F	21.0 °F
Humidity:	71%	66%	19%	44%
Wind Speed:	<b>0.0</b> mph	<b>10.9</b> mph	-	<b>1.6</b> mph
Wind Gust:	<b>0.0</b> mph	<b>10.9</b> mph	-	-
Wind:	SSE	•	<del>-</del> , ,	NNW
Pressure:	29.71in	<b>29.76</b> in	<b>29.63</b> in	<del>-</del> ,
Precipitation:	0.00in		,	

	High:	Low:	Average:
Temperature:	58.1 °F	<b>21.3</b> °F	<b>37.7</b> °F
Dew Point:	<b>33.3</b> °F	-14.5 °F	6.1 °F
Humidity:	66.0%	19.0%	28.6%
Wind Speed:	12.3mph from the NNE	•	1.6mph
Wind Gust:	12.3mph from the NNE	-	-
Wind:	<del>-</del>	-	West
Pressure:	<b>30.10i</b> n	<b>29.49</b> in	<b>.</b>
Precipitation:	0.00in		



# **History for KVAVIENN4**

Merrifield area, Vienna, VA — Current Conditions

#### Daily Summary for January 6, 2009

	Current:	High:	Low:	Average:
Temperature:	37.0 °F	40.1 °F	<b>32.5</b> °F	34.5 °F
Dew Point:	<b>36.0</b> °F	<b>29.7</b> °F	-0.3 °F	<b>23.1</b> °F
Humidity:	96%	88%	19%	68%
Wind Speed:	<b>0.0</b> mph	<b>5.3</b> mph	-	<b>0.2</b> mph
Wind Gust:	<b>0.0</b> mph	<b>5.3</b> mph	-	•
Wind:	North	- -	-	NNW
Pressure:	28.92in	29.73in	29.39in	-
Precipitation:	<b>0.59</b> in	gini	e an en	·

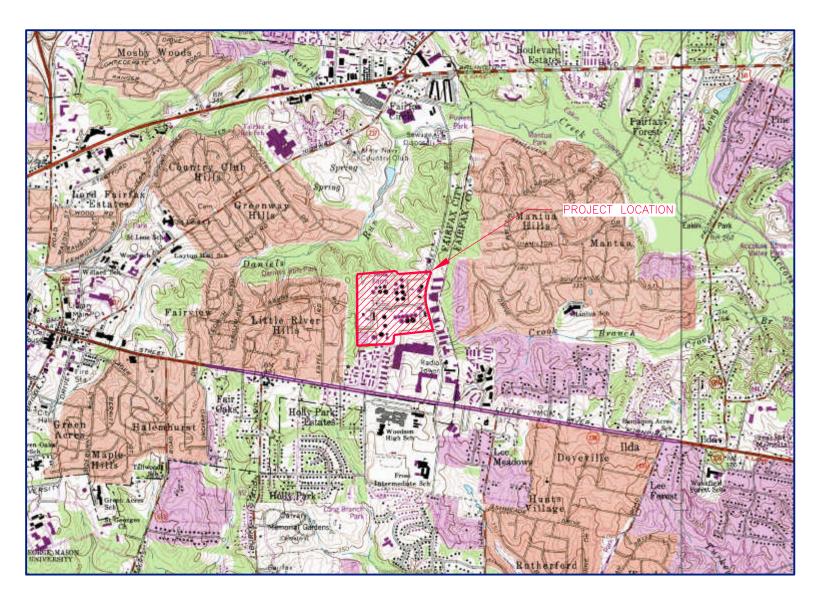
	High:	Low:	Average:
Temperature:	<b>58.1</b> °F	<b>21.3</b> °F	<b>37.2</b> °F
Dew Point:	<b>33.3</b> °F	-14.5 °F	9.0 °F
Humidity:	88.0%	19.0%	35.2%
Wind Speed:	12.3mph from the NNE	·	1.4mph
Wind Gust:	12.3mph from the NNE	·=	
Wind:	-	-	WNW
Pressure:	<b>30.10</b> in	<b>29.39</b> in	<del>-</del>
Precipitation:	<b>0.59i</b> n	· · · · · · · · · · · · · · · · · · ·	· ·· ·· ··········· ··················



**FIGURES** 



# STORMWATER ACTION PLAN FOR JOINT BASIN CORPORATION FAIRFAX TERMINAL COMPLEX 9601 COLONIAL AVENUE FAIRFAX, VIRGINIA



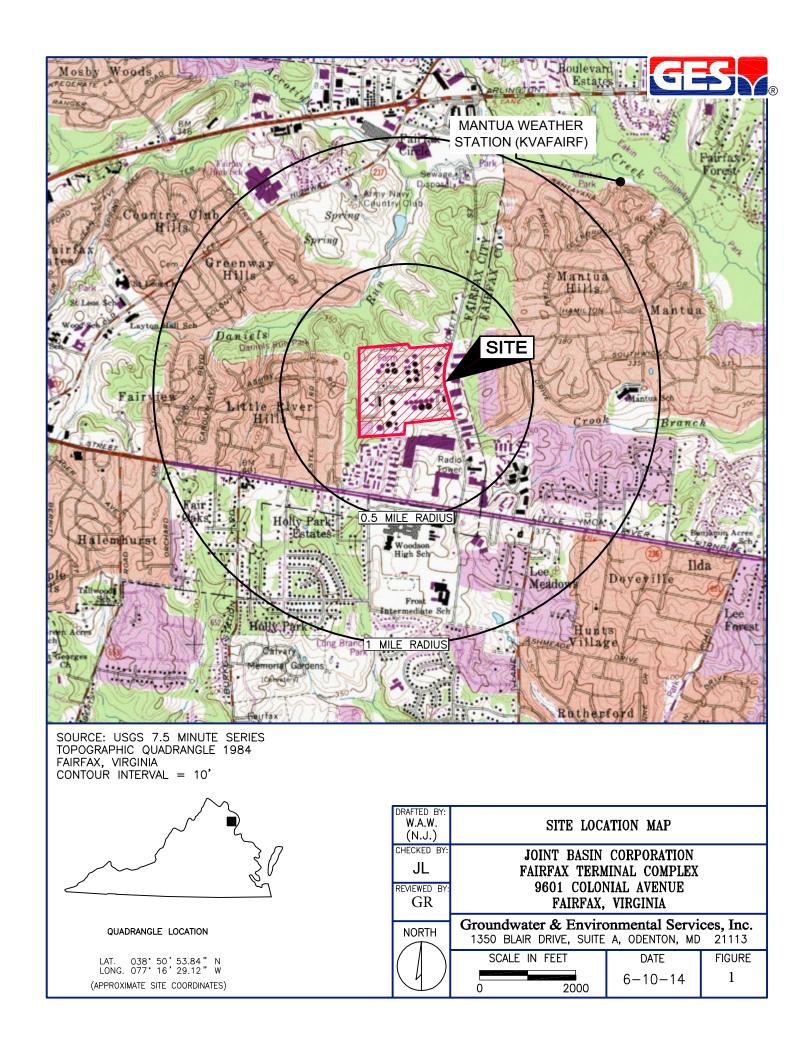
	DRAWING LIST				
FIGURE	TITLE				
	TITLE SHEET AND NOTES				
1	SITE LOCATION MAP				
2	EXTERNAL AND INTERNAL STORM WATER OUTFALL LOCATIONS				
3	FAIRFAX TERMINAL JOINT BASIN SITE MAP				
4	BUCKEYE WATER MANAGEMENT SCHEMATIC DIAGRAM				
5	CITGO WATER MANAGEMENT SCHEMATIC DIAGRAM				
6	TRANSMONTAIGNE WATER MANAGEMENT SCHEMATIC DIAGRAM				
7	MOTIVA WATER MANAGEMENT SCHEMATIC DIAGRAM				
8	DRAINAGE AREA OF FAIRFAX TERMINAL				
9	STORM WATER DRAINAGE SUB-AREAS				
10	BUCKEYE SURFACE WATER MANAGEMENT				
11	CITGO SURFACE WATER MANAGEMENT				
12	TRANSMONTAIGNE SURFACE WATER MANAGEMENT				
13	MOTIVA SURFACE WATER MANAGEMENT				
14	BUCKEYE OIL/WATER SEPARATOR				
15	TRANSMONTAIGNE OIL/WATER SEPARATOR				

#### NOTE:

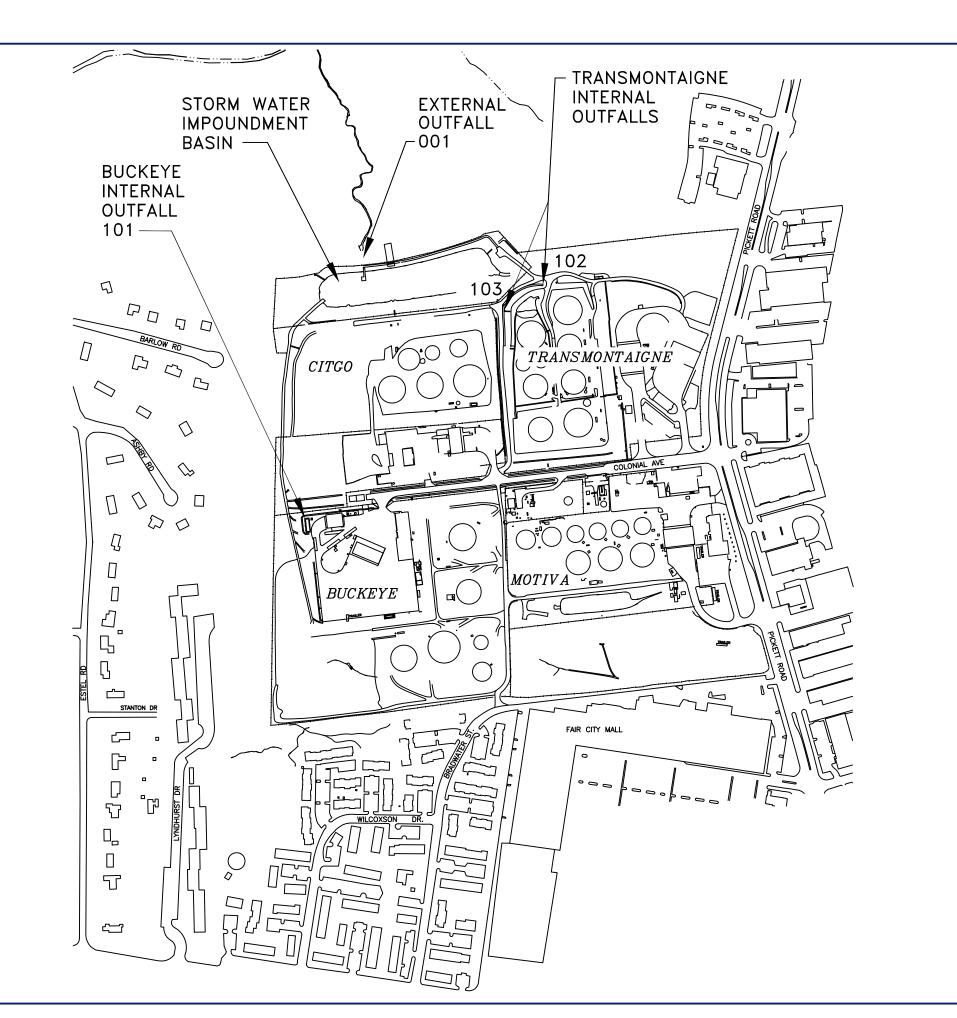
THE JOINT BASIN CORPORATION IS CO-OWNED BY FOUR PETROLEUM COMPANIES THAT OPERATE AT THE FAIRFAX TERMINAL COMPLEX:

- -BUCKEYE TERMINALS, LLC (BUCKEYE)
  -CITGO PETROLEUM CORPORATION (CITGO)
- -MOTIVA ENTERPRISES, LLC (MOTIVA)
- -TRANSMONTAIGNE, INC. (TRANSMONTAINGE)

RAFTED BY: W.A.W. (N.J.)	TITLE SHEET	T AND NOTES	
CHECKED BY:  JL  REVIEWED BY:  GR	FAIRFAX TERM 9601 COLOR	CORPORATION IINAL COMPLEX VIAL AVENUE VIRGINIA	
NORTH	Groundwater & Environ 1350 BLAIR DRIVE, SUITE		•
	NOT TO SCALE	DATE 6-25-14	figure NA

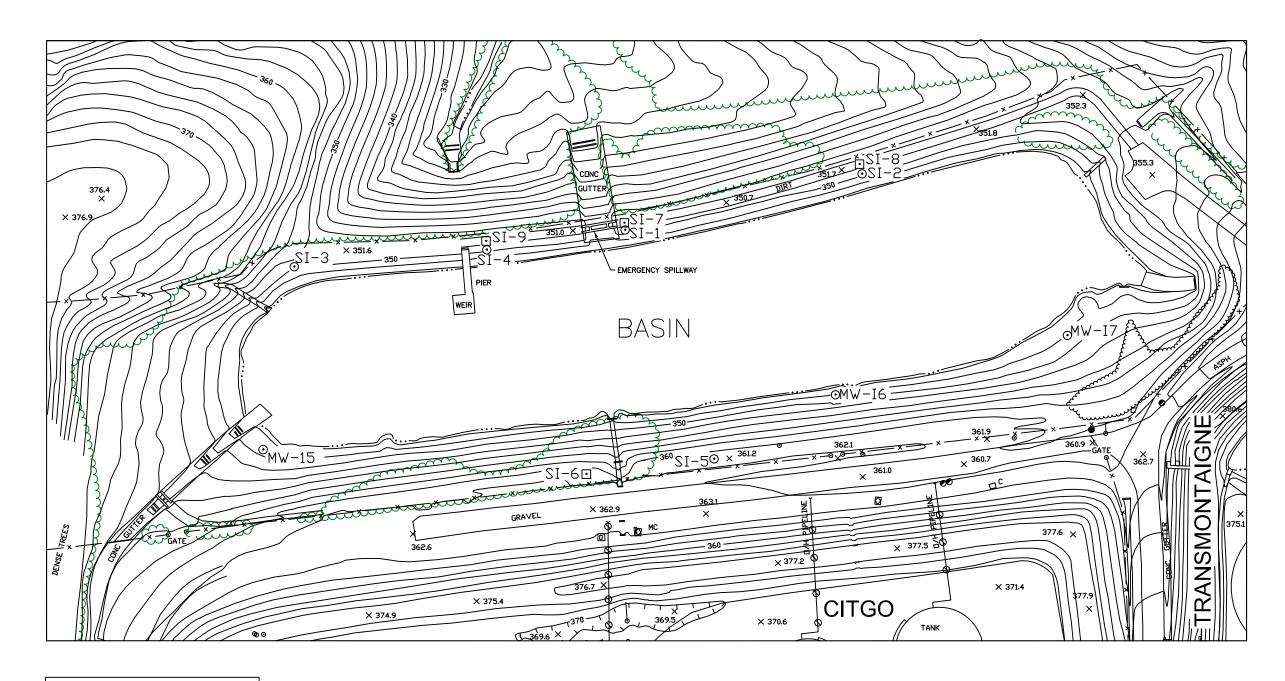






DRAFTED BY EXTERNAL AND INTERNAL STORMWATER OUTFALL LOCATIONS (N.J.) CHECKED B JOINT BASIN CORPORATION FAIRFAX TERMINAL COMPLEX JL 9601 COLONIAL AVENUE REVIEWED BY FAIRFAX, VIRGINIA GR Groundwater & Environmental Services, Inc. NORTH 1350 BLAIR DRIVE, SUITE A, ODENTON, MD 21113 SCALE IN FEET (APPROXIMATE) FIGURE 2 6-12-14





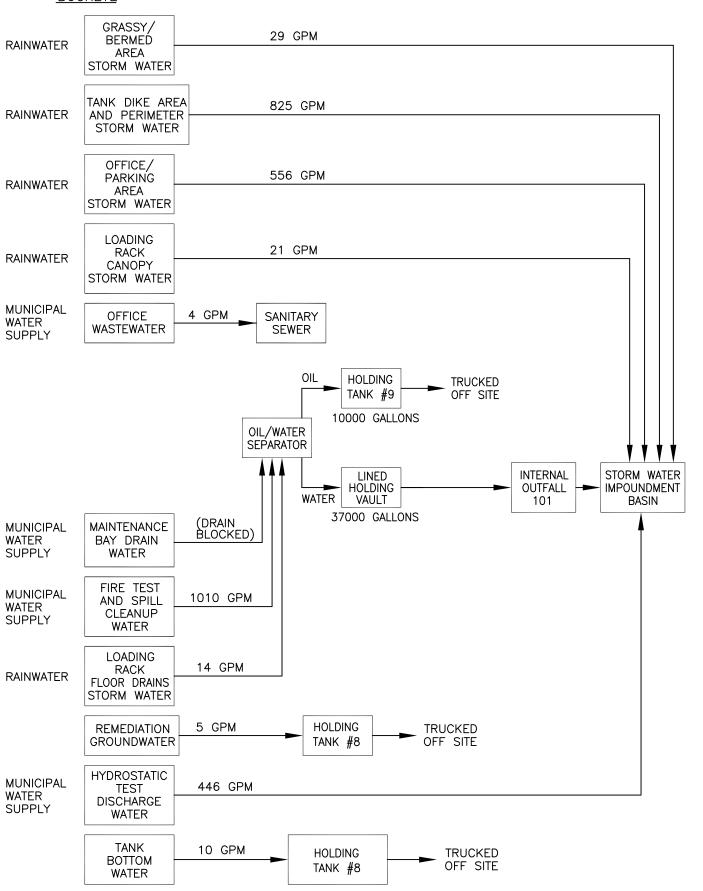
LEGEND					
_ × _	FENCE				
SI-1 ⊙	HANDEX-INSTALLED WELL				
SI-7 <b>⊡</b>	RADIAN-INSTALLED WELL				
MW-17 ⊙	CITGO MONITORING WELL				
× 374.9	ELEVATION POINT				

TOPOGRAPHY FROM AIR SURVEY CORPORATION (1992)

W.A.W. (N.J.)	FAIRFAX TERMINAL J	OINT BASIN SIT	E MAP	
CHECKED BY:  JL  REVIEWED BY:	FAIRFAX TERMINAL COMPLEX			
GR				
NORTH	Groundwater & Environ 1350 BLAIR DRIVE, SUITE		-	
	SCALE IN FEET	DATE	FIGURE	
4	(APPROXIMATE) 0 80	6-12-14	3	



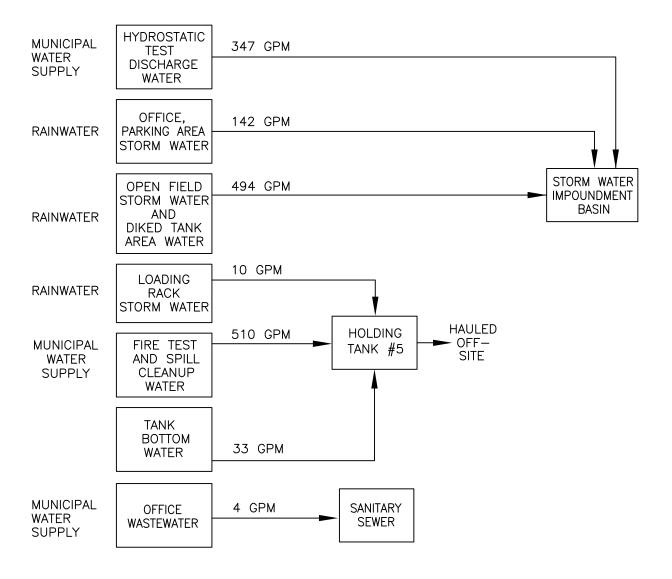
### **BUCKEYE**



DRAFTED BY: W.A.W. (N.J.)	BUCKEYE WATER MANAGEMENT SCHEMATIC DIAGRAM								
CHECKED BY:  JL  REVIEWED BY:  GR	JOINT BASIN CORPORATION FAIRFAX TERMINAL COMPLEX 9601 COLONIAL AVENUE FAIRFAX, VIRGINIA								
GK		Groundwater & Environmental Services, Inc. 1350 BLAIR DRIVE, SUITE A, ODENTON, MD 21113							
NOT TO SCALE		DATE 6-12-14	FIGURE  4						

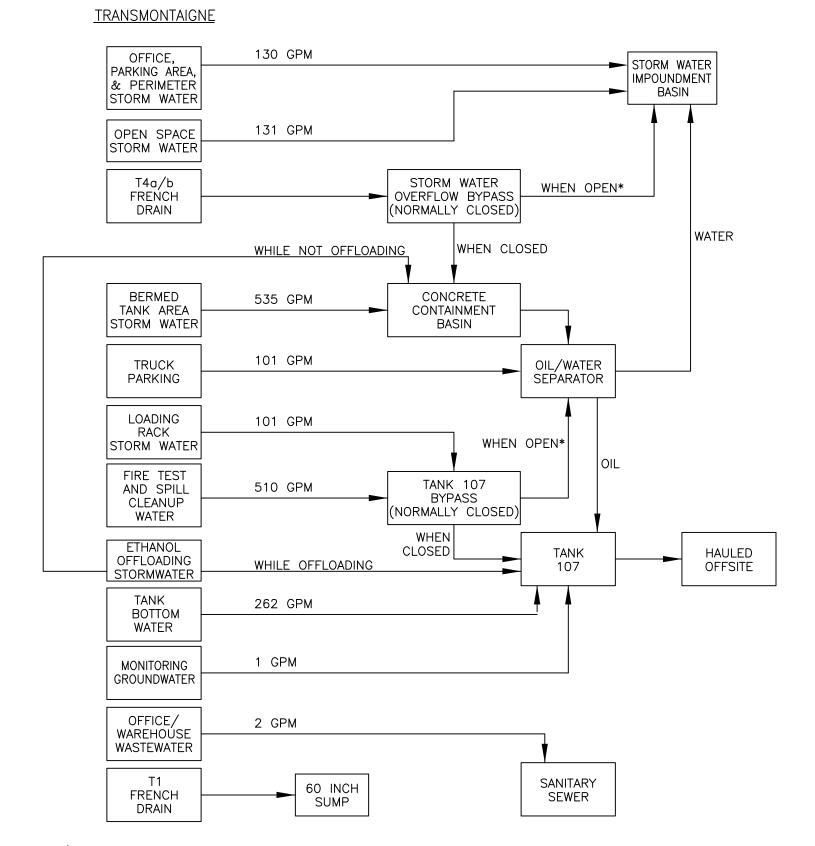


# <u>CITGO</u>



RAFTED BY: W.A.W. (N.J.)	CITGO WATER MANAGEMENT SCHEMATIC DIAGRAM								
HECKED BY:  JL  EVIEWED BY:  GR	JOINT BASIN CORPORATION FAIRFAX TERMINAL COMPLEX 9601 COLONIAL AVENUE FAIRFAX, VIRGINIA								
		Groundwater & Environmental Services, Inc. 1350 BLAIR DRIVE, SUITE A, ODENTON, MD 21113							
	NOT TO SCALE	DATE 6-12-14	FIGURE 5						



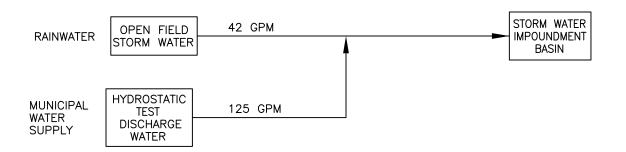


<sup>\*</sup> NOTE: THIS BYPASS WILL ONLY BE USED AS AN EMERGENCY DISCHARGE DURING A SEVERE RAINFALL EVENT.

DRAFTED BY: E.M.E. (N.J.)	TRANSMONTAIGNE STORM WATER IMPOUNDMENT BASIN SCHEMATIC DIAGRAM							
CHECKED BY:	JULION DASIN	CORPORATION						
JL		FAIRFAX TERMINAL COMPLEX						
REVIEWED BY:	9601 COLONIAL AVENUE							
GR	FAIRFAX,	FAIRFAX, VIRGINIA						
	Groundwater & Enviro	Groundwater & Environmental Services, Inc.						
	1350 BLAIR DRIVE, SUITE	A, ODENTON, MD	21113					
		DATE	FIGURE					
	NOT TO SCALE	6-24-14	6					



### <u>MOTIVA</u>

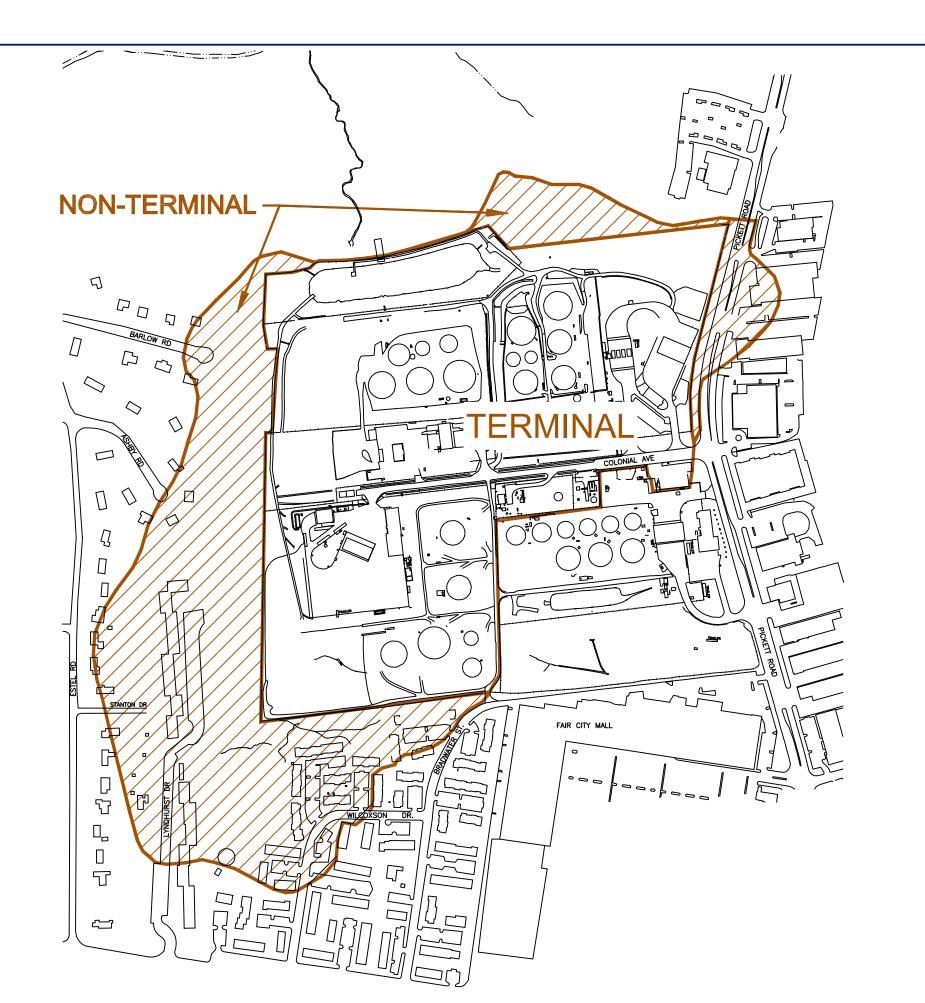


RAFTED BY: W.A.W. (N.J.)	MOTIVA WATER MANAGEMENT SCHEMATIC DIAGRAM							
HECKED BY:	JOINT BASIN CORPORATION FAIRFAX TERMINAL COMPLEX							
EVIEWED BY:	9601 COLONIAL AVENUE FAIRFAX, VIRGINIA							
GR	Groundwater & Environmental Services, Inc. 1350 BLAIR DRIVE, SUITE A, ODENTON, MD 21113							
	NOT TO SCALE	DATE 6-12-14	FIGURE 7					





DRAINAGE DIVIDE LINES

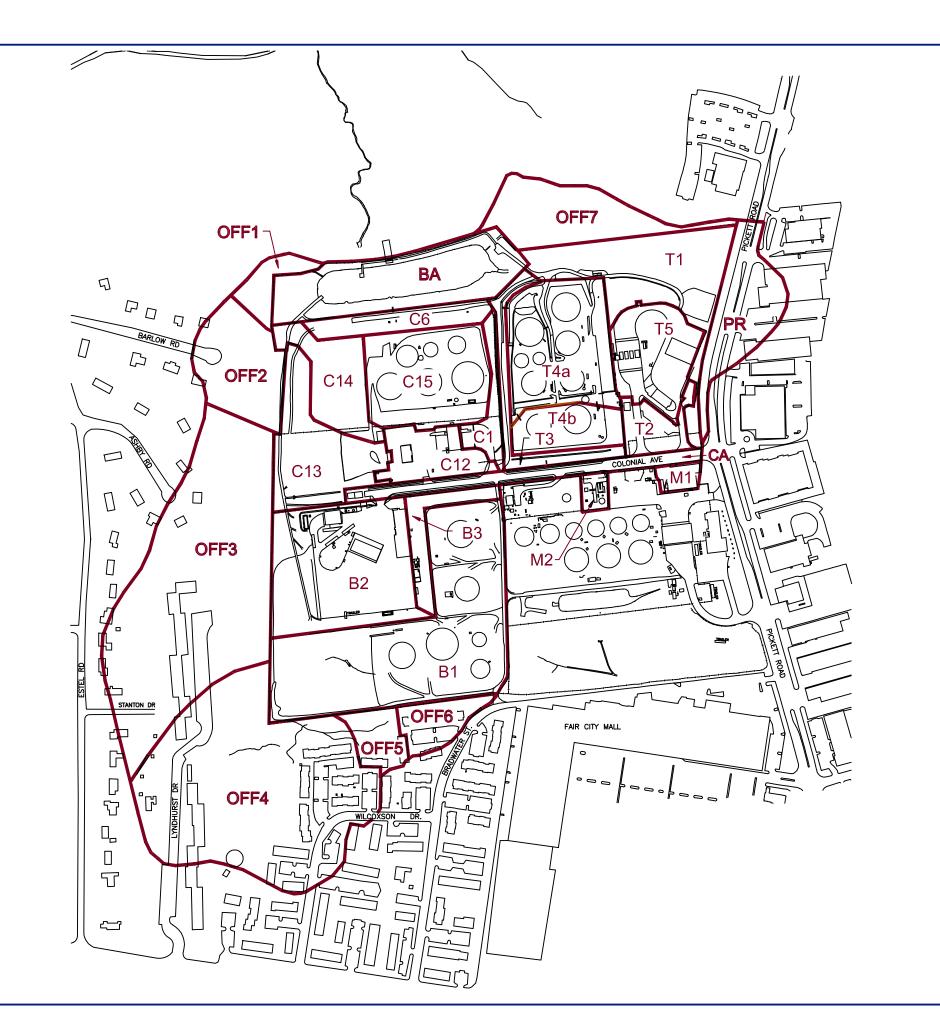


DRAFTED BY DRAINAGE AREA OF FAIRFAX TERMINAL (N.J.) CHECKED BY JOINT BASIN CORPORATION FAIRFAX TERMINAL COMPLEX 9601 COLONIAL AVENUE REVIEWED BY FAIRFAX, VIRGINIA GR Groundwater & Environmental Services, Inc. NORTH 1350 BLAIR DRIVE, SUITE A, ODENTON, MD 21113 SCALE IN FEET (APPROXIMATE) FIGURE 8 6-12-14



## LEGEND

DRAINAGE DIVIDE LINES



DRAFTED BY:
W.A.W.
(N.J.)

CHECKED BY:
JL

REVIEWED BY:
GR

STORMWATER DRAINAGE SUB-AREAS

JOINT BASIN CORPORATION
FAIRFAX TERMINAL COMPLEX
9601 COLONIAL AVENUE
FAIRFAX, VIRGINIA

NORTH

Groundwater & Environmental Services, Inc. 1350 BLAIR DRIVE, SUITE A, ODENTON, MD 21113

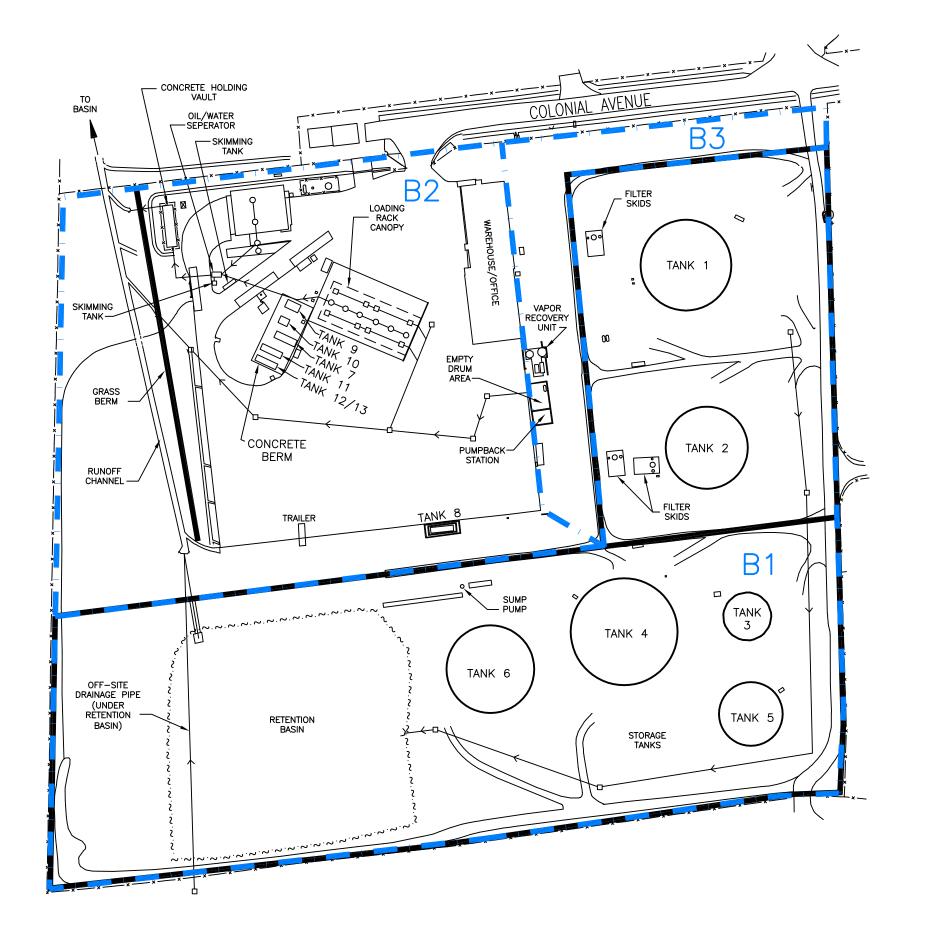
SCALE IN FEET DATE FIGURE

SCALE IN FEET (APPROXIMATE)
0 400

6-12-14

9





## **LEGEND**

CONTAINMENT DIKING

CONTAINMENT DIKING

STORM SEWER LINE

DRAIN LINE TO OIL/WATER SEPARATOR

LOADING RACK DRAIN LINE

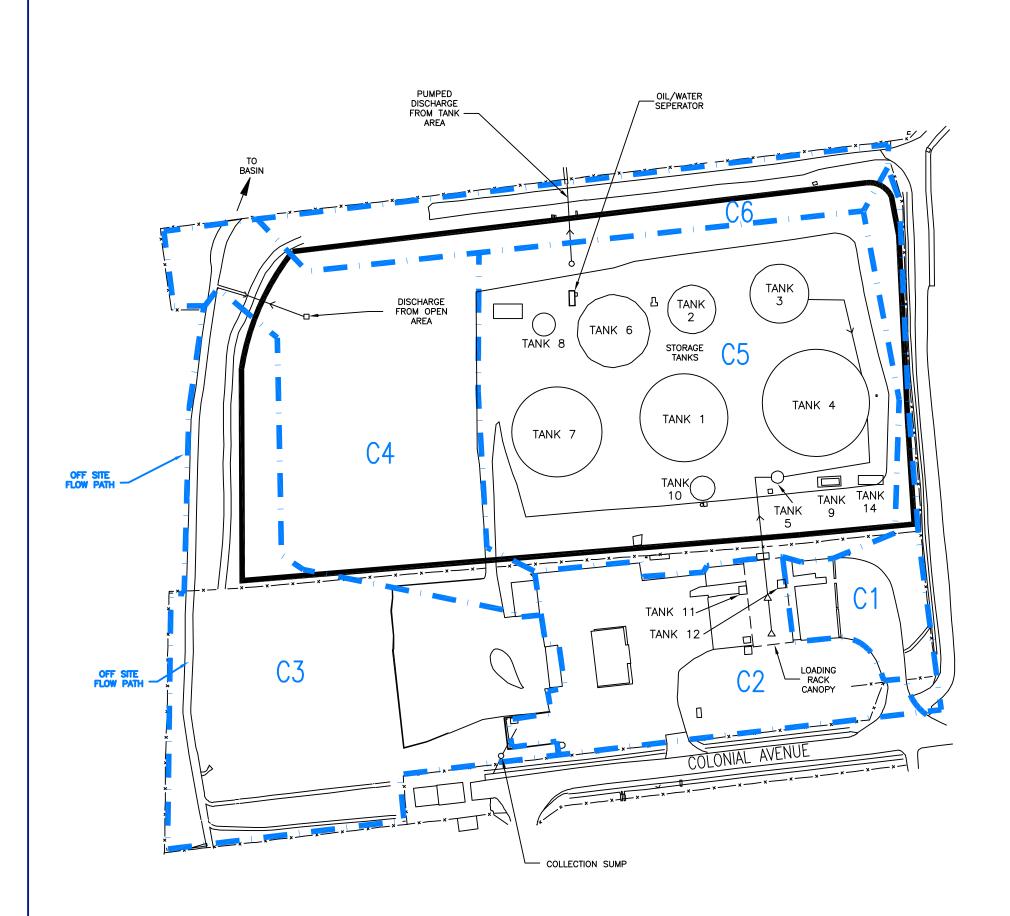
CONTAINMENT DIKING

DRAINAGE SUPPLY/SANITARY SEWER LINE

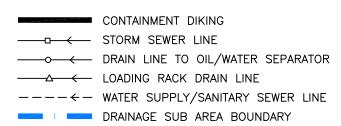
DRAINAGE SUB AREA BOUNDARY

DRAFTED BY: W.A.W. (N.J.)	BUCKEYE SURFACE	WATER MANAGE	EMENT
CHECKED BY:  JL  REVIEWED BY:	FAIRFAX TERM 9601 COLON	CORPORATION IINAL COMPLEX NIAL AVENUE VIRGINIA	
NORTH	Groundwater & Environ 1350 BLAIR DRIVE, SUITE		
	SCALE IN FEET (APPROXIMATE)	DATE 6-12-14	FIGURE 10





# <u>LEGEND</u>



DRAFTED BY: W.A.W. (N.J.)	CITGO SURFACE WATER MANAGEMENT						
CHECKED BY:	FAIRFAX TERM	CORPORATION INAL COMPLEX					
REVIEWED BY:	9601 COLONIAL AVENUE FAIRFAX, VIRGINIA						
NORTH		Groundwater & Environmental Services, Inc. 1350 BLAIR DRIVE, SUITE A, ODENTON, MD 21113					
	SCALE IN FEET (APPROXIMATE)	DATE 6-12-14	FIGURE 11				

OIL/WATER — SEPERATOR WITH SKIMMER

> RUN OFF-CHANNEL

> > TANK

TANK 116

POTENTIAL OFF SITE FLOW PATH

-POND PUMP

TANK 111

CONCRETE COLLECTION – BASIN

OUTFALL 103



## <u>LEGEND</u>

ROAD

PICKETT /

CONTAINMENT DIKING
FRENCH DRAINS
60 INCH SUMP

P FRENCH DRAIN PUMP

→ STORM SEWER LINE

— ○ ← DRAIN LINE TO OIL/WATER SEPARATOR
— △ ← LOADING RACK DRAIN LINE

————←— WATER SUPPLY/SANITARY SEWER LINE

DRAINAGE SUB AREA BOUNDARY

E.M.E. (N.J.)

CHECKED BY:

JU

FAIRFAX TERMINAL COMPLEX

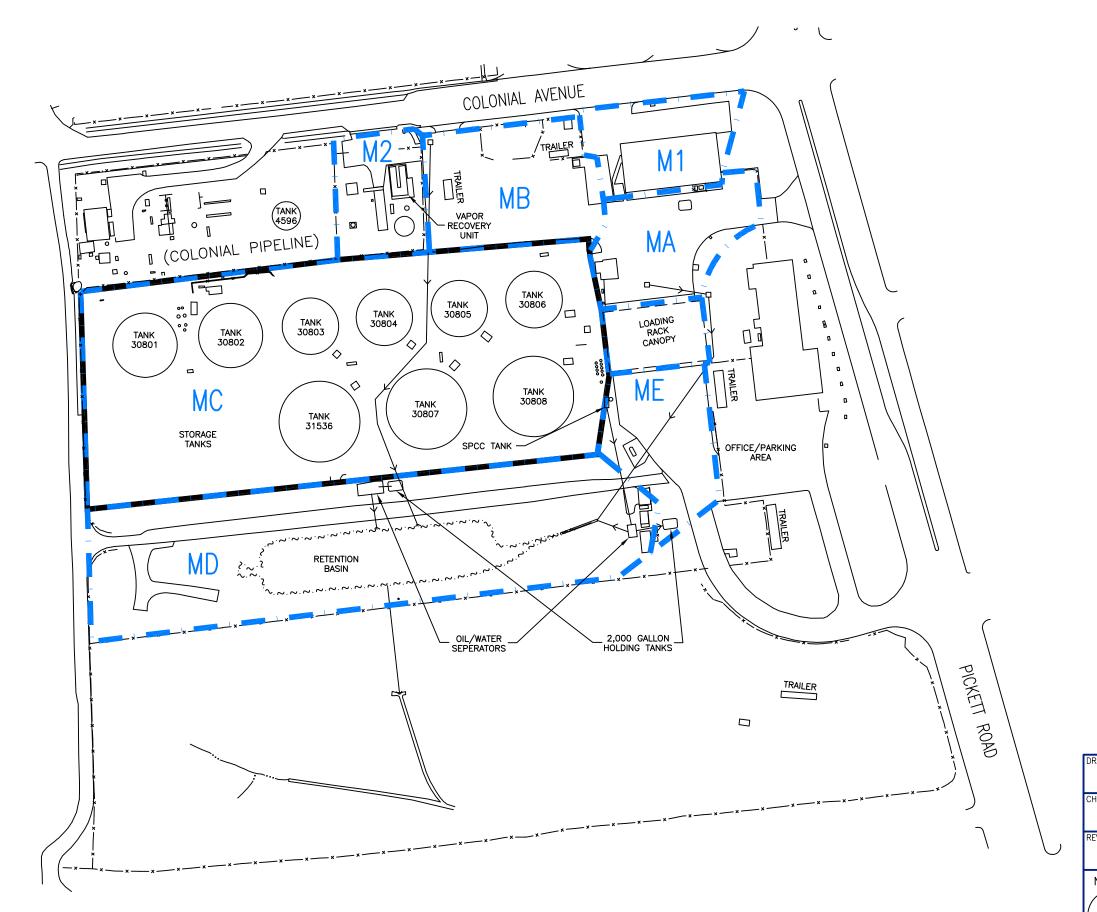
9601 COLONIAL AVENUE

FAIRFAX, VIRGINIA

ORTH Groundwater & Environmental Services, Inc. 1350 BLAIR DRIVE, SUITE A, ODENTON, MD 21113

SCALE IN FEET DATE FIGURE (APPROXIMATE) 6-25-14 12





# **LEGEND**

CONTAINMENT DIKING

STORM SEWER LINE

O ← DRAIN LINE TO OIL/WATER SEPARATOR

LOADING RACK DRAIN LINE

UNATER SUPPLY/SANITARY SEWER LINE

DRAINAGE SUB AREA BOUNDARY

DRAFTED BY: W.A.W. (N.J.)	MOTIVA SURFACE V	VATER MANAGE	MENT					
CHECKED BY:	JOINT BASIN	CORPORATION						
JL		IINAL COMPLEX						
REVIEWED BY:	9601 COLONIAL AVENUE							
GR	FAIRFAX,	FAIRFAX, VIRGINIA						
NORTH	Groundwater & Environ 1350 BLAIR DRIVE, SUITE							
	SCALE IN FEET	DATE	FIGURE					
\4 <i>)</i>	(APPROXIMATE)	6-12-14	13					

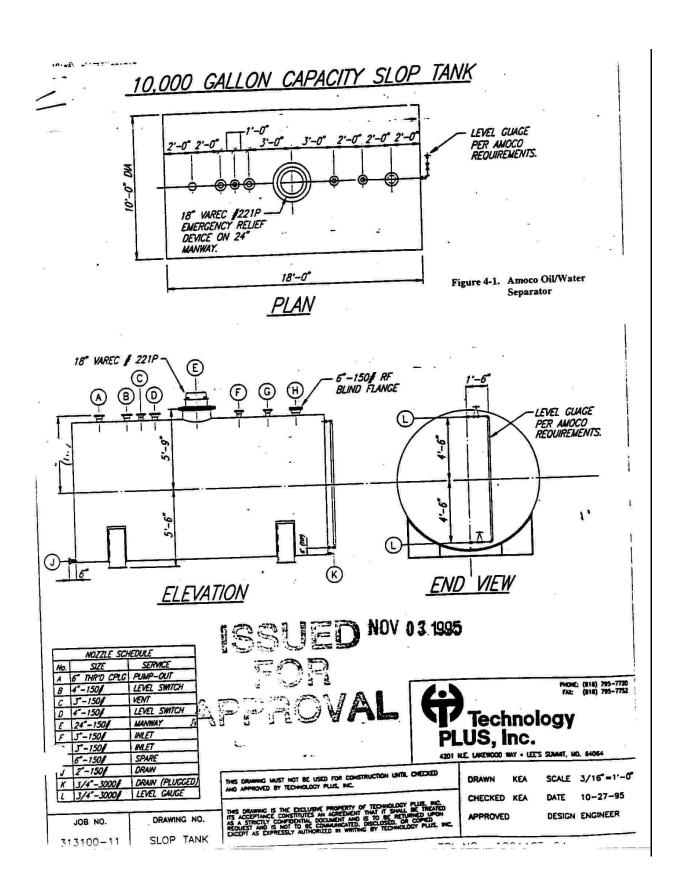


Figure 14 - Buckeye Oil/Water Separator

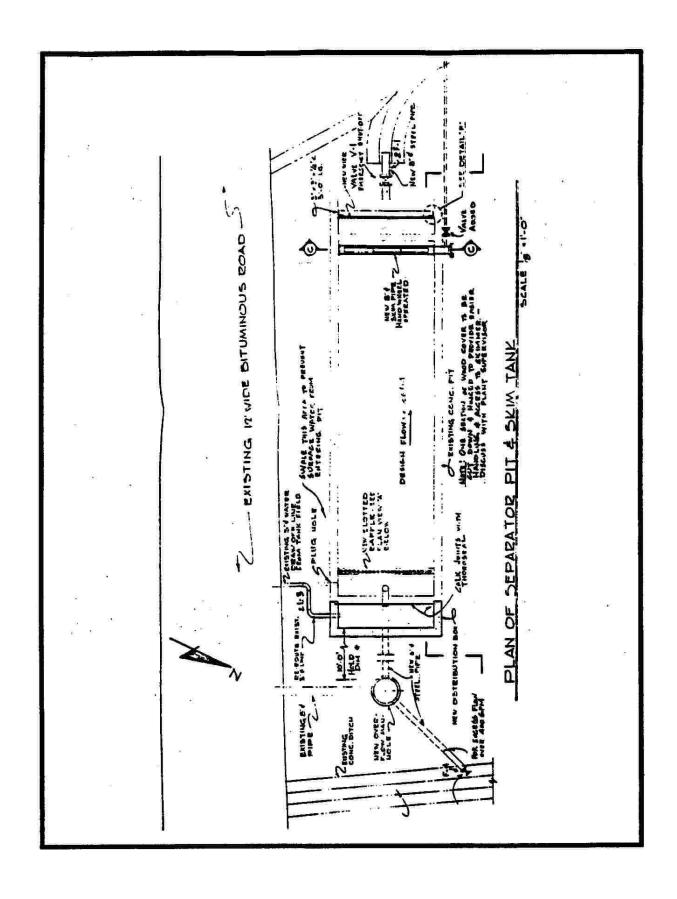


Figure 15 - TransMontaigne Oil/Water Separator



**TABLES** 



### INTERMITTENT FLOWS TO THE JBC BASIN

Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22301

Outfall Number	Company	Intermittent Flow	Frequency	Flow Rate (gpm)	Duration (hours)
106	BUCKEYE	Hydrostatic Test Discharge Water	Approx. 1 per 5 years	444	168
106	CITGO	Hydrostatic Test Discharge Water	Varies up to 1 per year	350	240
106	TRANSMONTAIGNE	Hydrostatic Test Discharge Water	Varies up to 2 per year	240	240
106	MOTIVA	Hydrostatic Test Discharge Water	Approx. 1 per 4 years	125	240

Notes:

1. gpm = gallons per minute



#### MATERIALS INVENTORY

Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22301

Outfall Number	Company	Tank Number	Capacity (gallons)	Product Stored
001, 101, 901	BUCKEYE	1 1	3,121,524	PBOB
001, 101, 701	2001212	2	2,541,042	Regular Gasoline
		3	906,444	Regular Gasoline
		4	4,478,628	RBOB
		5	1,603,560	Ethanol
		6	3,047,058	Ultra-Low Sulfur Diesel
		7	10,000	Invigorate
		8	10,000	PCW
		9	10,000	PCW
		10	4,000	Additive (currently not in use)
		11	10,000	Genaric
		12	3,000	Lubricity
		13	7,000	Nemo
		Unnumbered	55+	Various oil storage drums
001, 901	CITGO	1	3,184,000	Regular Gasoline
		2	951,000	Ethanol
		3	1,441,000	Regular Gasoline
		4	5,035,000	Ultra-Low Sulfur Diesel
		5	17,430	Slop Oil
		6	2,124,000	Premium Gasoline
		7	3,385,000	Ultra-Low Sulfur Diesel
		8	3,780	Remediation
		9	8,988	Gasoline Additive
		10	4,002	Pourback
		11	2,982	Premium Dist. Additive
		12	546	Red Dye
		14	9,500	Lubricity Additive
001, 102, 103, 901	TRANSMONTAIGNE	101	2,440,681	Regular Gasoline
		102	2,440,100	Regular Gasoline
		103	3,429,051	Ultra-Low Sulfur Diesel
		104	2,315,794	Ultra-Low Sulfur Diesel
		105	2,368,648	Premium Gasoline
		106	211,410	Ethanol
		107	16,360	PCW
		108	4,000	Additive
		109	586,484	Ethanol
		110	853,189	Ultra-Low Sulfur Diesel
		111	3,429,936	Regular Gasoline
		112	3,455,284	Regular Gasoline
		113	10,000	Additive
		114	966	Rack Overflow
		115	4,000	Additive
		116	2,000	Ultra-Low Sulfur Diesel (currently not in use)
		117A	1,441	Diesel Additives
		117B	3,008	Diesel Additives
		Unnumbered	200	Heating Fuel Oil
		Unnumbered	500	Heating Fuel Oil (currently not in use)
004 004		Unnumbered	55+	Various oil storage drums
001, 901	MOTIVA	NA	NA	NA

### Notes:

- 1. PBOB = Premium blendstock for oxygenate blending
- 2. RBOB = Reformulated blendstock for oxygenate blending
- 3. PCW = Petroleum contact water
- 4. NA = Not applicable

NOTE: This table only includes materials stored on property that drains to the Storm Water Impoundment Basin.



### Table 3

## STORM WATER RUNOFF STRUCTURAL AND NON-STRUCTURAL CONTROL MEASURES

Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22301

Outfall Number	Company	Control Measures	Codes from Table 2F-1
		Structural	
001, 101, 901	BUCKEYE	Diked tank field areas, concrete runoff channels, loading rack canopy, oil/water separator, concrete holding vault, holding tanks	1U, 4A
001, 901	CITGO	Diked tank field areas, concrete runoff channels, loading rack canopy, oil/water separator, holding tanks	1U, 4A
001, 102, 103, 901	TRANSMONTAIGNE	Diked tank field areas, concrete runoff channels, loading rack canopy, oil/water separator, holding basin	1U, 4A
001, 901	MOTIVA	Storm drains, runoff channels	1U, 4A
	]	Non-Structural	
001, 901	BUCKEYE, CITGO, TRANSMONTAIGNE, MOTIVA	Spill Prevention, Control, and Countermeasures Plans, employee training, visual inspections, preventative maintenance, good housekeeping measures. Additionally, all facilities operate under the City of Fairfax Department of Fire and Rescue, Office of Code Enforcement oversight (safety attendant present during locating, monthly high-level alarm inspections, and annual hazardous use permit inspections).	NA

Notes:

1. NA = Not applicable



### SIGNIFICANT LEAKS OR SPILLS IN THE LAST 3 YEARS

Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22301

Company	Date	Event	Product	Volume (gallons)
BUCKEYE	2/8/2011	Leak	Gasoline	<1
	6/9/2011	Spill	Ethanol	1
	11/4/2011	Spill	Gasoline	5
	3/25/2012	Spill	Gasoline	<1
	6/5/2012	Spill	Gasoline	<1
	8/15/2012	Spill	Gasoline	10
	9/28/2012	Spill	Gasoline	<1
	5/2/2013	Leak	Ethanol	<1
	9/10/2013	Spill	Gasoline	<1
	12/18/2013	Spill	Gasoline	30
	1/20/2014	Spill	Gasoline	15-20
	5/2/2014	Leak	Gasoline	<1
CITGO	NA	NA	NA	NA
TRANSMONTAIGNE	6/17/2010	Leak	Ultra-Low Sulfur Diesel	1
	2/16/2011	Spill	Oil	20
	2/17/2011	Spill	Oil	25
	7/17/2011	Spill	Ethanol	3
	8/10/2011	Spill	Transmix	5
	2/16/2013	Spill	Ultra-Low Sulfur Diesel	122
	9/28/2013	Spill	PCW	<1
	3/11/2014	Leak	Ultra-Low Sulfur Diesel	<1
MOTIVA	NA	NA	NA	NA

### Notes:

- 1. PBOB = Premium blendstock for oxygenate blending
- 2. RBOB = Reformulated blendstock for oxygenate blending
- 3. PCW = Petroleum contact water
- 4. NA = Not applicable
- 5. This table only includes materials stored on property that drains to the Storm Water Impoundment Basin.
- 6. A release is considered a leak when the source was a closed container/pipe and a spill when the source was an open container.



Outfall	Date	Flow (mgd)	Hd	TSS (mg/L)	TPH (mg/L)	TOC (mg/L)	TRC (mg/L)	Ethylbenzene (μg/L)	Benzene (µg/L)	Toluene (µg/L)	Naphthalene (μg/L)	МТВЕ (µg/L)	Total Xylenes (μg/L)
		Flo		TS	TPI	TO	TR	Ethy (	Senz	Coluc	Nap (	MTI	Tota (
001	Limits:	N/A	6.0-9.0	60	15	N/A	N/A	320	50	175	10	1840	33
	Jan-10	0.017	7.04	1.4	<ql< td=""><td>-</td><td>-</td><td><ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>141</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<></td></ql<></td></ql<>	-	-	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>141</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>141</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>141</td><td><ql< td=""></ql<></td></ql<></td></ql<>	<ql< td=""><td>141</td><td><ql< td=""></ql<></td></ql<>	141	<ql< td=""></ql<>
	Feb-10	0.019	6.90	4.0	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Mar-10	0.018	6.91	5.2	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Apr-10	0.017	6.93	<ql< th=""><th><ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<></th></ql<>	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	May-10	0.017	6.95	<ql< th=""><th><ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<></th></ql<>	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Jun-10	0.017	7.00	1.2	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Jul-10	0.016	6.93	1.0	<ql< th=""><th>-</th><th>-</th><th>&lt;QL</th><th><ql< th=""><th><ql< th=""><th>&lt;QL</th><th>44.4</th><th>&lt;10</th></ql<></th></ql<></th></ql<>	-	-	<QL	<ql< th=""><th><ql< th=""><th>&lt;QL</th><th>44.4</th><th>&lt;10</th></ql<></th></ql<>	<ql< th=""><th>&lt;QL</th><th>44.4</th><th>&lt;10</th></ql<>	<QL	44.4	<10
	Aug-10	0.019	6.88	40.3	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Sep-10	0.016	6.91	2.1	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Oct-10	0.017	6.83	2.9	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Nov-10	0.018	7.00	5.2	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Dec-10	0.016	7.10	2.4	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Jan-11	0.016	7.22	5.2	<ql< td=""><td>-</td><td>-</td><td><ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>161</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<></td></ql<></td></ql<>	-	-	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>161</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>161</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>161</td><td><ql< td=""></ql<></td></ql<></td></ql<>	<ql< td=""><td>161</td><td><ql< td=""></ql<></td></ql<>	161	<ql< td=""></ql<>
	Feb-11	0.016	6.99	3.3	<ql< td=""><td>-</td><td>-</td><td><ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>172</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<></td></ql<></td></ql<>	-	-	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>172</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>172</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>172</td><td><ql< td=""></ql<></td></ql<></td></ql<>	<ql< td=""><td>172</td><td><ql< td=""></ql<></td></ql<>	172	<ql< td=""></ql<>
	Mar-11	0.017	6.9	4.8	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Apr-11	0.019	6.87	3.7	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	May-11	0.018	6.93	<ql< td=""><td><ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<></td></ql<>	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Jun-11	0.016	6.77	5.6	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>=</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	=	-	-
	Jul-11	0.015	6.91	4.8	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Aug-11	0.017	6.83	4.4	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th></th><th>-</th></ql<>	-	-	-	-	-	-		-
	Sep-11	0.017	6.76	8.8	<ql< th=""><th>-</th><th>-</th><th><ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th>&lt;5</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	-	-	<ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th>&lt;5</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th><ql< th=""><th>&lt;5</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th>&lt;5</th><th><ql< th=""></ql<></th></ql<></th></ql<>	<ql< th=""><th>&lt;5</th><th><ql< th=""></ql<></th></ql<>	<5	<ql< th=""></ql<>
	Oct-11	0.02	6.54	14.5	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Nov-11	0.017	6.22	1.4	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Dec-11	0.016	6.07	1.6	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Jan-12	0.017	6.83	2.7	<ql< td=""><td>-</td><td>-</td><td>-</td><td>- OT</td><td>-</td><td>-</td><td>-</td><td>- OT</td></ql<>	-	-	-	- OT	-	-	-	- OT
	Feb-12	0.015	6.60	7.0	<ql< td=""><td>-</td><td>-</td><td><ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>18.8</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<></td></ql<></td></ql<>	-	-	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>18.8</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>18.8</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>18.8</td><td><ql< td=""></ql<></td></ql<></td></ql<>	<ql< td=""><td>18.8</td><td><ql< td=""></ql<></td></ql<>	18.8	<ql< td=""></ql<>
	Mar-12	0.016	7.39	2.9	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Apr-12	0.017	7.39	<ql< td=""><td><ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<></td></ql<>	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	May-12	0.016	7.11	2.2	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Jun-12 Jul-12	0.016 0.015	7.32 7.59	1.3	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Jui-12 Aug-12	0.013	7.59 6.2	12.9 11	<ql &lt;4.7</ql 	-	-	- -OI	-OI	<ql< td=""><td>- <ql< td=""><td>2.8</td><td>- -OI</td></ql<></td></ql<>	- <ql< td=""><td>2.8</td><td>- -OI</td></ql<>	2.8	- -OI
	Sep-12	0.003	6.2 6.97	14	<4.7 <4.7	-	-	<ql< td=""><td><ql< td=""><td>&lt;ŲL</td><td><ql< td=""><td>۷.٥</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td>&lt;ŲL</td><td><ql< td=""><td>۷.٥</td><td><ql< td=""></ql<></td></ql<></td></ql<>	<ŲL	<ql< td=""><td>۷.٥</td><td><ql< td=""></ql<></td></ql<>	۷.٥	<ql< td=""></ql<>
	Oct-12	0.007	8.34	6.9	<4.7 <5.4	-	-	-	-	-	-	-	-
	Nov-12	0.0014	7.11	<5	<ql< th=""><th>_</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>_ [ ]</th></ql<>	_	-	-	-	-	-	-	_ [ ]
	Dec-12	0.0114	6.7	8.0	<ql <ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th></th></ql<></ql 	-	-	-	-	-	-	-	
	Jan-13	0.054	6.02	8.0	<ql <ql< th=""><th>-</th><th><u>-</u></th><th>-</th><th>-</th><th>_</th><th>_</th><th>-</th><th>  </th></ql<></ql 	-	<u>-</u>	-	-	_	_	-	
	Feb-13	0.034	6.30	7.0	<ql< th=""><th>-</th><th>-</th><th>-</th><th>_</th><th>-</th><th>_</th><th>-</th><th> ]</th></ql<>	-	-	-	_	-	_	-	]
	Mar-13	0.043	7.16	7.0 7.4	<ql <ql< th=""><th>-</th><th>-</th><th>_</th><th>-</th><th>-</th><th>-</th><th>-</th><th> ]</th></ql<></ql 	-	-	_	-	-	-	-	]
	Apr-13	0.054	7.16	1.9	0.50	-	-	-	_	-	_	-	]
	May-13	0.034	7.20	<5.0	0.89	_	_	<ql< td=""><td>- -\OI</td><td><ql< td=""><td><ql< td=""><td>9.5 J</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<>	- -\OI	<ql< td=""><td><ql< td=""><td>9.5 J</td><td><ql< td=""></ql<></td></ql<></td></ql<>	<ql< td=""><td>9.5 J</td><td><ql< td=""></ql<></td></ql<>	9.5 J	<ql< td=""></ql<>



Outfall	Date	Flow (mgd)	hН	TSS (mg/L)	TPH (mg/L)	TOC (mg/L)	TRC (mg/L)	Ethylbenzene (μg/L)	Benzene (µg/L)	Toluene (µg/L)	Naphthalene (μg/L)	MTBE (μg/L)	Total Xylenes (μg/L)
		I		L		I	L	Ā	Be	_	Z	M	T
001 (cont.)	Limits:	N/A	6.0-9.0	60	15	N/A	N/A	320	50	175	10	1840	33
	Jun-13	0.0173	7.23	5.0	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Jul-13	0.0617	7.36	5.0	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Aug-13	0.03	7.01	8.0	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Sep-13	0.04	7.33	< 5.0	<QL	-	-	-	-	-	-	-	-
	Oct-13	0.03	7.05	2.9	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Nov-13	0.02	7.08	3.5 B	0.66	-	-	<ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th>12</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th><ql< th=""><th>12</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th>12</th><th><ql< th=""></ql<></th></ql<></th></ql<>	<ql< th=""><th>12</th><th><ql< th=""></ql<></th></ql<>	12	<ql< th=""></ql<>
	Dec-13	0.2	6.8	2.9	<QL	-	-	-	-	-	-	-	-
	Jan-14	0.01	7.45	12	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Feb-14	0.09	6.89	7.7	<QL	-	-	-	-	-	-	-	-
	Mar-14	0.2	7.4	5.9	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Apr-14	0.2	7.2	11	<ql< td=""><td>-</td><td>-</td><td><ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>18</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<></td></ql<></td></ql<>	-	-	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>18</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>18</td><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>18</td><td><ql< td=""></ql<></td></ql<></td></ql<>	<ql< td=""><td>18</td><td><ql< td=""></ql<></td></ql<>	18	<ql< td=""></ql<>
	May-14	0.1	7.3	4.0	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
101	Limits:	N/A	N/A	N/A	15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mar-10	0.004	-	-	0.7	-	-	-	-	-	-	-	-
	May-10	0.003	-	-	0.9	-	-	-	-	-	-	-	-
	Aug-10	0.004	-	-	<ql< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	-	-	-	-	-	-	-	-
	Nov-10	0.003	-	-	<QL	-	-	-	-	-	-	-	-
	Feb-11	0.003	-	-	2.0	-	-	-	-	-	-	-	-
	Apr-11	0.003	-	-	1.5	-	-	-	-	-	-	-	-
	Sep-11	0.003	-	-	<QL	-	-	-	-	-	-	-	-
	Oct-11	0.004	-	-	1.6	-	-	-	-	-	-	-	-
	Mar-12	0.002	-	-	0.8	-	-	-	-	-	-	-	-
	Apr-12	0.001	-	-	2.7	-	-	-	-	-	-	-	-
	Aug-12	0.002	-	-	< 5.4	-	-	-	-	-	-	-	-
	Dec-12	0.01	-	-	2.0	-	-	-	-	-	-	-	-
	Mar-13	0.086	-	-	1.3	-	-	-	-	-	-	-	-
	Jun-13	0.0432	-	-	1.4	-	-	-	-	-	-	-	-
	Aug-13	0.001	-	-	1.7	-	-	-	-	-	-	-	-
	Oct-13	0.012		=	<ql< th=""><th>-</th><th>-</th><th></th><th></th><th>-</th><th>-</th><th></th><th>-</th></ql<>	-	-			-	-		-



Outfall	Date	Flow (mgd)	Hd	TSS (mg/L)	TPH (mg/L)	TOC (mg/L)	TRC (mg/L)	Ethylbenzene (μg/L)	Benzene (µg/L)	Toluene (µg/L)	Naphthalene (μg/L)	MTBE (µg/L)	Total Xylenes (μg/L)
102	Limits:	N/A	N/A	N/A	15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mar-10	0.004	-	-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	May-10	0.003	-	-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Aug-10	0.005	-	-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Nov-10	0.004	-	-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Feb-11	0.005	-	-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Apr-11	0.005		-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Sep-11	0.004	-	-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Oct-11	0.005	-	-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Mar-12	0.004	-	-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Apr-12	0.004	-	-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Aug-12	0.001	-	-	< 5.4	-	-	-	-	-	-	-	-
	Oct-12	0.00038	-	-	<5.1	-	-	-	-	-	-	-	-
	Mar-13	0.001	-	-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	May-13	0.001	-	-	0.54	-	-	-	-	-	-	-	-
	Jul-13	0.001	-	-	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
103	Nov-13 Limits:	0.001 N/A	N/A	N/A	<ql 30</ql 	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
103	Sep-11	0.005	1N/A	IN/A	<ql< th=""><th>- IN/A</th><th>IN/A</th><th>IN/A</th><th>IN/A</th><th>IN/A</th><th>IN/A</th><th>IN/A</th><th>IN/A</th></ql<>	- IN/A	IN/A	IN/A	IN/A	IN/A	IN/A	IN/A	IN/A
	Jun-12	0.005	_	_	<ql< th=""><th>_</th><th>_</th><th>_</th><th>_</th><th>_</th><th>_</th><th>_</th><th>_</th></ql<>	_	_	_	_	_	_	_	_
	Oct-12	3.83 X 10 <sup>-7</sup>			<2.6								
106	Limits:	N/A	6.0-9.0	N/A	15	N/A	0.016	320	50	175	10	N/A	33
100	Oct-12	NA	6.74	<ql< th=""><th><ql< th=""><th>1.9</th><th><ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th>-</th><th>&lt;10</th></ql<></th></ql<></th></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th>1.9</th><th><ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th>-</th><th>&lt;10</th></ql<></th></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	1.9	<ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th>-</th><th>&lt;10</th></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th>-</th><th>&lt;10</th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th><ql< th=""><th>-</th><th>&lt;10</th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th>-</th><th>&lt;10</th></ql<></th></ql<>	<ql< th=""><th>-</th><th>&lt;10</th></ql<>	-	<10
	Oct-12	1.49 x 10 <sup>-6</sup>	8.23	11	<5.0	2.2	<ql< th=""><th><ql< th=""><th><ql< th=""><th></th><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th></th><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th></th><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<>		<ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<>	_	<ql< th=""></ql<>
	Jun-13	NA	7.19	37	1.1	15	<ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th><ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<>	<ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<>	_	<ql< th=""></ql<>
	Jul-13	0.35	7.57	<5.0	<ql< th=""><th>0.88 J</th><th><ql< th=""><th><ql< th=""><th><ql< th=""><th></th><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	0.88 J	<ql< th=""><th><ql< th=""><th><ql< th=""><th></th><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th><ql< th=""><th></th><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th></th><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<>		<ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<>	_	<ql< th=""></ql<>
	Dec-13	NA	7.8	4.1	2.3 B	1.6	<ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th>_</th><th><ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<>	_	<ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<>	<ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<>	_	<ql< th=""></ql<>
	Dec-13	0.7	8.0	<ql< th=""><th><ql< th=""><th>1.4</th><th><ql< th=""><th><ql< th=""><th></th><th><ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th>1.4</th><th><ql< th=""><th><ql< th=""><th></th><th><ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	1.4	<ql< th=""><th><ql< th=""><th></th><th><ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<></th></ql<>	<ql< th=""><th></th><th><ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<></th></ql<>		<ql< th=""><th><ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<></th></ql<>	<ql< th=""><th>_</th><th><ql< th=""></ql<></th></ql<>	_	<ql< th=""></ql<>
<u>ı</u>	DCC 13	0.7	0.0	√ <b>V</b> L	√ <b>Q</b> Ľ	1,7	√ <b>V</b> L	√ <b>Q</b> L	√ <b>Q</b> L	<i>√</i> QĽ	√VL		√ <b>Q</b> Ľ



Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22301

Outfall	Date	Flow (mgd)	Hd	TSS (mg/L)	TPH (mg/L)	TOC (mg/L)	TRC (mg/L)	Ethylbenzene (μg/L)	Benzene (µg/L)	Toluene (µg/L)	Naphthalene (μg/L)	MTBE (µg/L)	Total Xylenes (μg/L)
901	Limits:	N/A	6.0-9.0	60	30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mar-10	0.123	6.91	4.9	<QL	-	-	-	-	-	-	-	-
	May-10	0.121	6.95	<ql< th=""><th>&lt;QL</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	<QL	-	-	-	-	-	-	-	-
	Aug-10	0.124	6.86	40.0	<QL	-	-	-	-	-	-	-	-
	Nov-10	0.123	7.00	4.8	<QL	-	-	-	-	-	-	-	-
	Mar-11	0.122	6.90	4.6	<QL	-	-	-	-	-	-	-	-
	Apr-11	0.124	6.87	3.3	<QL	-	-	-	-	-	-	-	-
	Sep-11	0.121	6.76	4.8	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Oct-11	0.124	6.54	14.2	<QL	-	-	-	-	-	-	-	-
	Mar-12	0.120	7.39	3.8	<QL	-	-	-	-	-	-	-	-
	Apr-12	0.121	7.39	<ql< td=""><td>&lt;QL</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></ql<>	<QL	-	-	-	-	-	-	-	-
	Aug-12	0.007	6.98	<5	<4.9	-	-	-	-	-	-	-	-
	Dec-12	0.086	6.85	17	0.55	-	-	-	-	-	-	-	-
	Feb-13	0.086	6.06	12	<QL	-	-	-	-	-	-	-	-
	May-13	0.432	6.81	< 5.0	0.77	-	-	-	-	-	-	-	-
	Aug-13	0.043	7.33	< 5.0	<ql< th=""><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th><th>-</th></ql<>	-	-	-	-	-	-	-	-
	Nov-13	0.043	7.15	4.5	0.64	-	-	-	-	-		-	-

#### Notes:

- 1. mgd = million gallons per day
- 2. TSS = total suspended solids
- 3. mg/L = milligrams per liter
- 4. TPH = total petroleum hydrocarbons
- 5. TOC = total organic carbon
- 6. TRC = total residual chlorine
- 7.  $\mu$ g/L = micrograms per liter
- 8. MTBE = methyl tert-butyl ether
- 9. QL = Quantification Level
- 10. <QL indicates a result was less than the QL.
- 11. indicates that no data is available.
- 12. A J Qualifier indicates an estimated value beween the reporting limit and the method detection limit.
- 13. A B Qualifier indicates that the compound was found in the blank as well as the sample.



# **DISCHARGE INFORMATION (5-Year Attachment A Sampling)**

Attachment A Sampling Results - May 14 a	nd 22, 2014	
METALS		
Antimony, dissolved	< 0.0053	mg/L
Arsenic, dissolved	<0.0068	mg/L
Cadmium, dissolved	< 0.00023	mg/L
Chromium III, dissolved	< 0.0010	mg/L
Chromium VI, dissolved	< 0.0010	mg/L
Chromium, dissolved	< 0.00050	mg/L
Copper, dissolved	0.0022	mg/L
Lead, dissolved	0.00033 J	mg/L
Mercury, dissolved	< 2.80	ng/l
Nickel, dissolved	0.0020	mg/L
Selenium, dissolved	< 0.00050	mg/L
Silver, dissolved	< 0.00011	mg/L
Thallium, dissolved	< 0.00015	mg/L
Zinc, dissolved	0.0077 J	mg/L
PESTICIDES/PCBS		, i
Aldrin	< 0.0016	μg/L
Chlordane	< 0.065	μg/L
Chlorpyrifos (synonym = Dursban)	<1.9	μg/L
4,4'-DDD	< 0.0043	μg/L
4,4'-DDE	< 0.0040	μg/L
4,4'-DDT	< 0.0042	μg/L
Demeton-o	<1.9	μg/L
Demeton-s	<1.9	μg/L
Dieldrin	< 0.0041	μg/L
Alpha-Endosulfan (Endosulfan I)	< 0.0041	μg/L
Beta-Endosulfan (Endosulfan II)	< 0.0089	μg/L
Endosulfan Sulfate	< 0.0040	μg/L
Endrin	< 0.0057	μg/L
Endrin Aldehyde	< 0.016	μg/L
Guthion (azinphos-methyl)	<1.9	μg/L
Heptachlor	< 0.0021	μg/L
Heptachlor Epoxide	< 0.0021	μg/L
Hexachlorocyclohexane Alpha-BHC	< 0.0026	μg/L
Hexachlorocyclohexane Beta-BHC	< 0.0020	μg/L
Hexachlorocyclohexane Gamma-BHC	0.0032 J	μg/L
Kepone	<25	μg/L
Malathion	<1.9	μg/L
Methoxychlor	<0.040	μg/L μg/L
Mirex	<0.040	μg/L μg/L
Parathion	<0.0061 <1.9	μg/L μg/L
PCB 1260 (Aroclor 1260)	< 1.9 < 0.12	μg/L μg/L
PCB 1250 (Aroclor 1250) PCB 1254 (Aroclor 1254)		μg/L μg/L
PCB 1254 (Aroclor 1254) PCB 1248 (Aroclor 1248)	<0.081 <0.081	μg/L μg/L
PCB 1246 (Aroclor 1246) PCB 1242 (Aroclor 1242)		
· · · · · · · · · · · · · · · · · · ·	< 0.081	μg/L
PCB 1232 (Aroclor 1232)	< 0.081	μg/L
PCB 1221 (Aroclor 1221)	< 0.081	μg/L
PCB 1016 (Aroclor 1016)	< 0.081	μg/L
PCB Total	< 0.081	μg/L
Toxaphene	< 0.24	μg/L



# **DISCHARGE INFORMATION (5-Year Attachment A Sampling)**

Attachment A Sampling Results - May 14 and 22, 2014  BASE NEUTRAL EXTRACTABLES  Acenaphthene <0.3 µg Anthracene <0.2 µg Benzidine <19 µg Benzo(a)anthracene <0.2 µg Benzo(b)fluoranthene <0.3 µg Benzo(k)fluoranthene <0.3 µg Benzo(a)pyrene <0.3 µg Bis 2-Chloroethyl Ether <0.4 µg Bis 2-Chloroisopropyl Ether <0.3 µg	/L /L /L /L /L /L
Acenaphthene       <0.3	/L /L /L /L /L /L /L
Anthracene       <0.2	/L /L /L /L /L /L /L
Benzidine <19 µg Benzo(a)anthracene <0.2 µg Benzo(b)fluoranthene <0.3 µg Benzo(k)fluoranthene <0.3 µg Benzo(a)pyrene <0.3 µg Bis 2-Chloroethyl Ether <0.4 µg Bis 2-Chloroisopropyl Ether <0.3 µg	/L /L /L /L /L /L
Benzo(a)anthracene <0.2 µg Benzo(b)fluoranthene <0.3 µg Benzo(k)fluoranthene <0.3 µg Benzo(a)pyrene <0.3 µg Bis 2-Chloroethyl Ether <0.4 µg Bis 2-Chloroisopropyl Ether <0.3 µg	/L /L /L /L /L /L
Benzo(b)fluoranthene <0.3 µg Benzo(k)fluoranthene <0.3 µg Benzo(a)pyrene <0.3 µg Bis 2-Chloroethyl Ether <0.4 µg Bis 2-Chloroisopropyl Ether <0.3 µg	/L /L /L /L /L
Benzo(k)fluoranthene <0.3 µg Benzo(a)pyrene <0.3 µg Bis 2-Chloroethyl Ether <0.4 µg Bis 2-Chloroisopropyl Ether <0.3 µg	/L /L /L /L
Benzo(a)pyrene <0.3 μg Bis 2-Chloroethyl Ether <0.4 μg Bis 2-Chloroisopropyl Ether <0.3 μg	/L /L /L
Bis 2-Chloroethyl Ether <0.4 μg Bis 2-Chloroisopropyl Ether <0.3 μg	/L /L
Bis 2-Chloroisopropyl Ether <0.3 μg	/L
Butyl Benzyl Phthalate <0.8 μg	
2-Chloronaphthalene <0.2 µg	
Chrysene <0.2 µg	
, ,	
, 9	
1,3-Dichlorobenzene <1 μg 1,4-Dichlorobenzene <1 μg	
3,3-Dichlorobenzidine < 0.8 µg	
,	
Dimethyl Phthalate <0.9 μg 2,4-Dinitrotoluene <0.4 μg	
Hexachlorocyclopentadiene <2 µg	
Hexachloroethane <0.4 µg	
Indeno(1,2,3-cd)pyrene <0.3 µg	
Isophorone <0.3 µg	
Nitrobenzene <0.5 µg	
N-Nitrosodimethylamine <2 μg	
N-Nitrosodi-n-propylamine <0.4 µg	
N-Nitrosodiphenylamine <0.3 µg	
Pyrene <0.2 µg	
1,2,4-Trichlorobenzene <0.3 μg  VOLATILES	/L
Acrolein <10 µg	/1
Acrolein < 10 μg Acrylonitrile <10 μg	
Benzene <0.9 µg	
Bromoform <0.8 µg	
Carbon Tetrachloride <1 µg	
Carbon retractionide < 1 µg Chlorobenzene (monochlorobenzene) < 0.8 µg	
Chlorodibromomethane (Dibromochloromethane) <0.8 µg	
Chloroform <1 µg	
Dichlorobromomethane (bromodichloromethane) <0.7 μg 1,2-Dichloroethane <1 μg	
1,1-Dichloroethylene (1,1-dichloroethene) < 0.9 µg	



### **DISCHARGE INFORMATION (5-Year Attachment A Sampling)**

Fairfax Terminal Complex 9601 Colonial Avenue Fairfax, VA 22301

Attackers and A Committee of Describe - Mary 14 and 4	22. 2014							
Attachment A Sampling Results - May 14 and 22, 2014								
VOLATILES (cont.)								
trans-1,2-Dichloroethylene (trans-1,2-dichloroethene)	<1	μg/L						
1,2-Dichloropropane	<1	μg/L						
cis-1,3-Dichloropropene	<1	μg/L						
trans-1,3-Dichloropropene	< 0.6	μg/L						
Ethylbenzene	< 0.8	μg/L						
Methyl Bromide (bromomethane)	<2	μg/L						
1,1,2,2-Tetrachloroethane	<1	μg/L						
Tetrachloroethylene (tetrachloroethene)	<1	μg/L						
Toluene	< 0.8	μg/L						
1,1,2-Trichloroethane	<1	μg/L						
Trichloroethylene (trichloroethene)	<1	μg/L						
Vinyl Chloride	<2	μg/L						
ACID EXTRACTABLES								
2-Chlorophenol	< 0.3	μg/L						
2,4-Dichlorophenol	< 0.3	μg/L						
2,4-Dimethylphenol	< 0.3	μg/L						
2,4-Dinitrophenol	< 9	μg/L						
2-Methyl-4,6-Dinitrophenol (4,6-Dinitro-2-methylphenol)	<4	μg/L						
Pentachlorophenol	<3	μg/L						
Phenol	< 0.4	μg/L						
2,4,6-Trichlorophenol	< 0.7	μg/L						
MISCELLANEOUS								
Ammonia as NH3-N	< 0.20	mg/L						
Chlorides	12.4	mg/L						
Chlorine, Total Residual	0.11	mg/L						
Cyanide, Total	< 0.0050	mg/L						
Hydrogen Sulfide	< 0.054	mg/L						
Sulfide, dissolved	< 0.054	mg/L						
Tributyltin	< 0.002	μg/L						
Hardness as CaCO3 (Calcium Carbonate)	22.6	mg/L						
Calcium	5.78	mg/L						
Magnesium	1.99	mg/L						

### Notes:

- 1. mg/L = milligrams per liter
- 2.  $\mu$ g/L = micrograms per liter
- 3. <# indicates a result was less than the detection limit of #.
- 4. PCB = polychlorinated biphenyl
- 5.  $J = estimated value The result is \ge the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).$